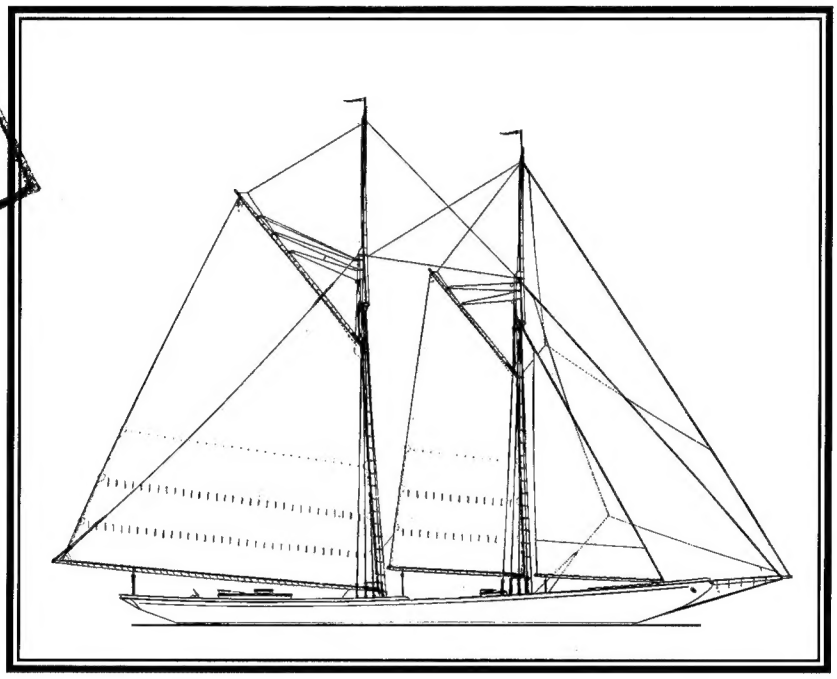
COESAM/PDER-95-004

UNDERWATER ARCHAEOLOGICAL SURVEY OF PANAMA CITY HARBOR AND PASS BAY COUNTY, FLORIDA



for

Mobile District
U.S. Army Corps of Engineers

Contract No. DACW01-94-D-0055
EN-MS Project Number C-94-183

April 1995

John E. Chance & Associates, Inc.
Lafayette, Louisiana

L.A. Landry & Associates, Inc.
Hitchcock, Texas

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

A marine remote sensing survey to locate submerged cultural resources was conducted in the Panama City Harbor Navigation Project area by John E. Chance & Associates, Inc. and L. A. Landry & Associates, Inc. The surveyed area lies along a dynamic shoreline and has sustained more than 50 years of periodic dredging. No features of historic significance were detected. The Percy Payne wreck site was surveyed to establish its coordinates.

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UNDERWATER ARCHAEOLOGICAL SURVEY OF PANAMA CITY HARBOR AND PASS BAY COUNTY, FLORIDA

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Mobile District
U.S. Army Corps of Engineers
Contract No. DACW01-94-D-0055
EN-MS Project Number C-94-183

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April 1995

ABSTRACT

In October, 1994, an underwater archeological survey using marine remote sensing equipment to locate and identify submerged cultural resources in the Panama City Harbor Navigation Project area was conducted by John E. Chance & Associates, Inc., and L. A. Landry & Associates, Inc., for the Army Corps of Engineers, Mobile District. The project is entirely within the existing boundaries of the navigation channel, which will be deepened, but not widened. The surveyed area lies along a dynamic shoreline comprised of migrating spits, bars and passes, and has sustained more than fifty years of periodic dredging activity. Evaluation of the survey data indicates that none of the five channel bottom targets nor any of the 20 unidentified magnetic anomalies represent significant cultural resources but are considered to represent probable modern debris. A reported wreck site, tentatively identified as the schooner *Percy Payne,* was also surveyed to obtain its precise coordinates.

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Cover: Sail plan of fishing schooner *Columbia,* typical of vessels built in the northeast for red snapper fishing in the Gulf of Mexico. (source Davis 1929:34-35)

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CHAPTER 1 INTRODUCTION

In October 1994, John E. Chance & Associates, Inc. (JECA), and L.A. Landry & Associates, Inc., conducted a marine remote sensing survey of the Panama City Harbor federal navigation project area for the U.S. Army Corps of Engineers, Mobile District (COE). The investigation was implemented in response to the COE Scope of Work for Contract Number DACW0I-94-D-0055 and EN-MS Project Number C-94-183 and was conducted in partial fulfillment of the Mobile District's obligations under Federal regulations, including the National Historic Preservation Act of 1966 (Public Law 89-665), as amended; the National Environmental Policy Act of 1969 (Public Law 91-190); the Archeological and Historic Preservation Act of 1974 (Public Law 93-291); the Archeological Resources Protection Act of 1979 (Public Law 96-96); and the Abandoned Shipwreck Act of 1987. The underwater archeological survey was conducted within the limits of the existing navigation channel in Bay County, Florida, in order to determine the presence of submerged historic resources that could be affected by proposed channel dredging operations.

The Scope of Work for this project specified an underwater historic resources survey of the harbor channel from the 45-ft bathymetric contour in the Gulf of Mexico to the Panama City Docks at Dyers Point (Figure 1). No widening of the existing channel is proposed, only deepening. The improvements will provide a 38-ft deep, 450-ft wide Gulf approach channel narrowing to 300 ft to provide a 36-ft deep by 300-ft wide channel to Dyers Point Terminal in northwestern St. Andrews Bay.

In addition to the survey of the existing navigation channel, the COE also requested a survey of a reported shipwreck off St. Andrew's State Park to determine its precise coordinates. This wreck was observed as an offshore target on an aerial photograph included in an information package for a proposed beach renourishment project. The wreck site was brought to the attention of the COE by employees of the Florida Department of Environmental Protection who reviewed this project in 1991.

The survey was conducted October 11-14, 1994. Differential GPS was used for horizontal positioning. The survey vessel was equipped with an Echotrac echo sounder, a GeoMetrics 801/3 proton magnetometer, and an E.G.& G. Model 260Seafloor Mapping System. The survey grid provided overlapping coverage with the sonar and a representative sampling of the channel with the magnetometer and echo sounder systems.

There were 28 magnetic anomalies recorded during the survey, of which 20 remain unidentified. All of the unidentified anomalies are isolated, low amplitude, and of short duration, with signatures suggesting point sources of ferrous material. None are interpreted as potentially significant cultural features. There were five sonar targets recorded, none are identifiable as possible shipwreck remains or other features of cultural significance.

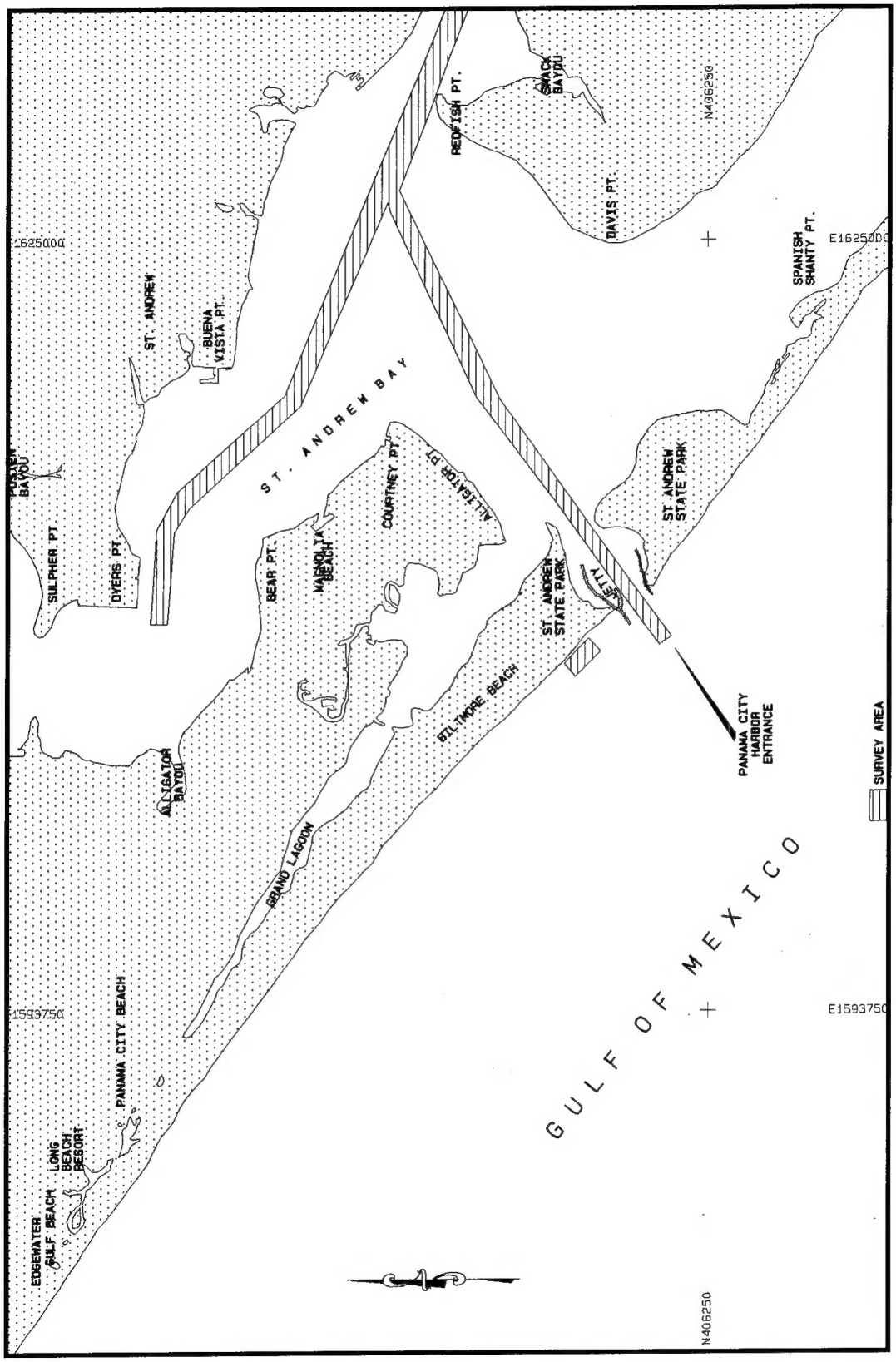

Figure 1 Project Location Map

Kenneth Leger, HI-MAP Survey Division of John E. Chance & Associates, Inc., supervised the project. Doug Delcambre served as Party Chief and survey positioning technician in the field. Kevin Swart assisted as the geophysical instrument technician, and is commended for his perseverance in trouble-shooting the magnetometer. Michelle LaGrange, with humor and persistence, assisted in the preparation of the maps. Jim Hauser, L.A. Landry & Associates, Inc., assisted with reduction of the data, production of the figures and report, and provided considerable support throughout the project. Laura A. Landry, of L.A. Landry & Associates, Inc., Hitchcock, Texas, was consulting marine archeologist to John E. Chance & Associates, Inc., for this project and author of this report.

The results of this survey are presented in the following chapters. Chapter II describes the natural and cultural settings and the results of the archival survey. Chapter III details the field survey and analysis of the data. Conclusions and recommendations are in Chapter IV. The Table of Magnetic Anomalies, Table 1, and Table of Side Scan Sonar Contacts, Table 2, comprise Appendix A. The Magnetic Contour Maps and Bathymetric Contour Maps with their respective indices constitute Appendix B.

CHAPTER 2 NATURAL AND CULTURAL SETTING

Natural Setting

The project area is located entirely in Bay County, Florida, in the Gulf coastal plain lowlands of the south-central part of the Florida panhandle. The climate is humid subtropical, with an annual mean temperature of 68o F. Rainfall averages 58 in per year, with a maximum precipitation during the months of July, August, and September (Schmidt and Clark 1980).

The coastal environment of Bay County is characterized by recent geomorphic features formed in response to fluctuations in sea level from the Pleistocene to the present. The most prominent landforms include beach dunes along the shore and wave cut bluffs surrounding the estuary of St. Andrews Bay. Fine quartz sand and shell fragments comprise the three barrier islands in the county. Shell Island is the largest and most northwesterly island. Dog Island, an emergent island born from a shallow shoal, appeared in 1954 or 1955, and was attached to the mainland by the 1970s. Crooked Island, the most easterly of the barriers, has migrated landward since its appearance in 1779 (Doyle et al. 1984:67, 72-74).

A comparison of shoreline surveys from Bay County for 1855, 1934, 1945, and 1968 to 1970 indicate that the shoreline has undergone significant morphological changes during this interval. Since 1856, the shoreline from St. Andrews State Park west to Oriole St., about 2.5 mi (4.1 km), the overall erosion rate has been 0.7 ft a year (Doyle et al. 1984:74). This slow but constant reworking of the shore is in response to culturally induced modifications resulting from urbanization (including attempts at beach stabilization and navigation controls), erosion accompanying surges from major storms and hurricanes, and the ongoing slower processes of longshore currents and wind-generated waves. Rising sea level is the underlying mechanism driving the landward advance of the shoreline (Doyle et al. 1984:72).

Shell Island is an 11-mile long barrier spit extending east from Panama City Beach across the mouth of St. Andrews Bay. Historic period maps from the coastal surveys of 1854 and 1855, and from 1874 to 1970, show inlets and passes at different locations, indicating the island has been broached several times by the Gulf of Mexico (Doyle et al. 1984:72). A hurricane cut West Pass across the southern portion of the island in 1856 that was closed again in 1861. It reopened in 1881. Maps from the early part of the 20th century show no pass to the Bay except at the eastern end of the island (Figure 2). In 1934, the U.S. Army COE cut a deep water pass across the mid section of island, protecting the seaward approach with east and west jetties (Figure 3). This channel was initially cut to a depth of 27 ft (COE 1938). Prior to construction of this pass, ship traffic entered St. Andrews Bay at the eastern end of the Island. During the past 130

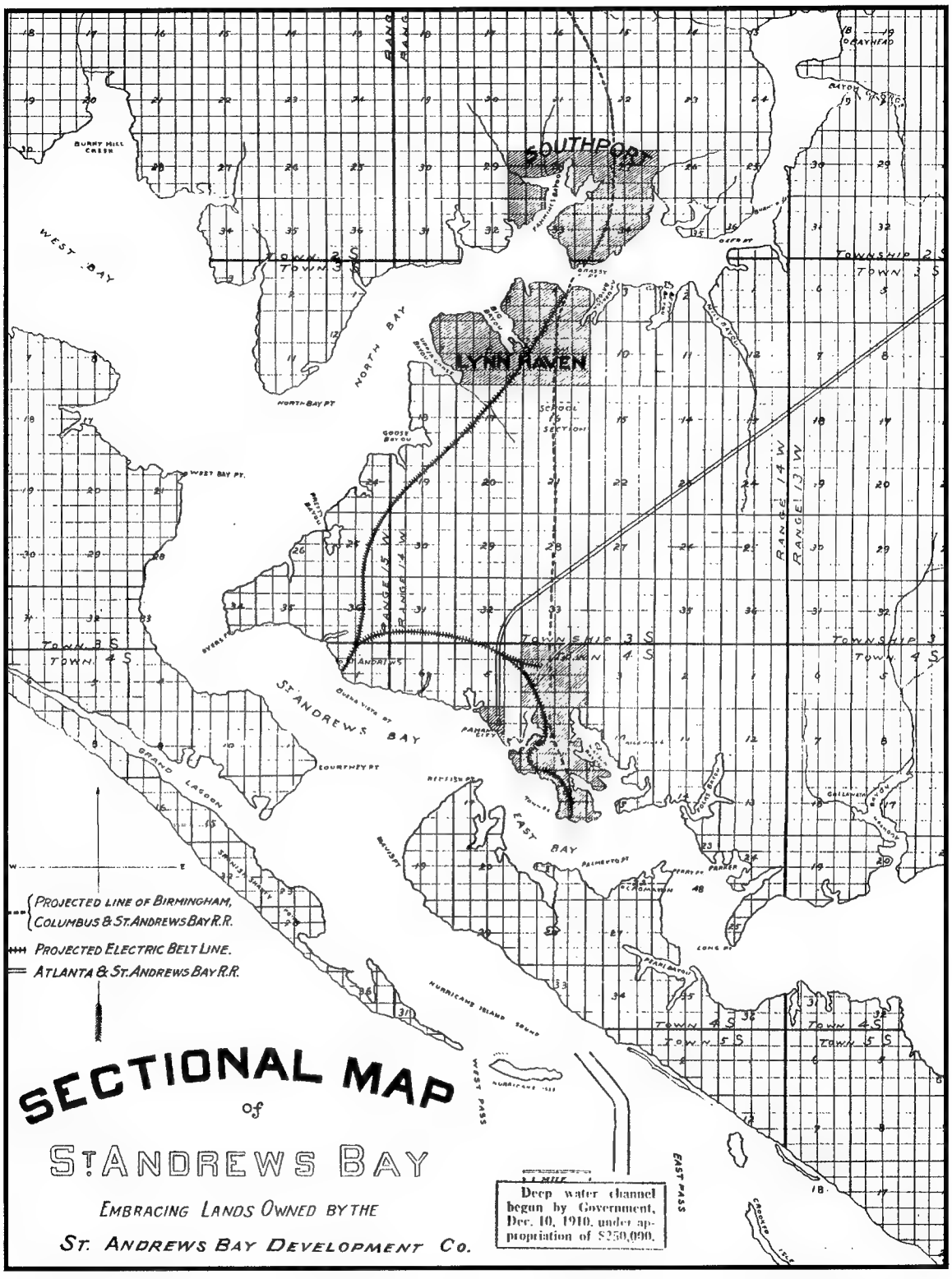

Figure 2. Portion of ca. 1914 map of St. Andrews Bay showing the old pass at the mouth of Hurricane Island Sound before the 1943 opening of a deep draft channel across the middle of Shell Island

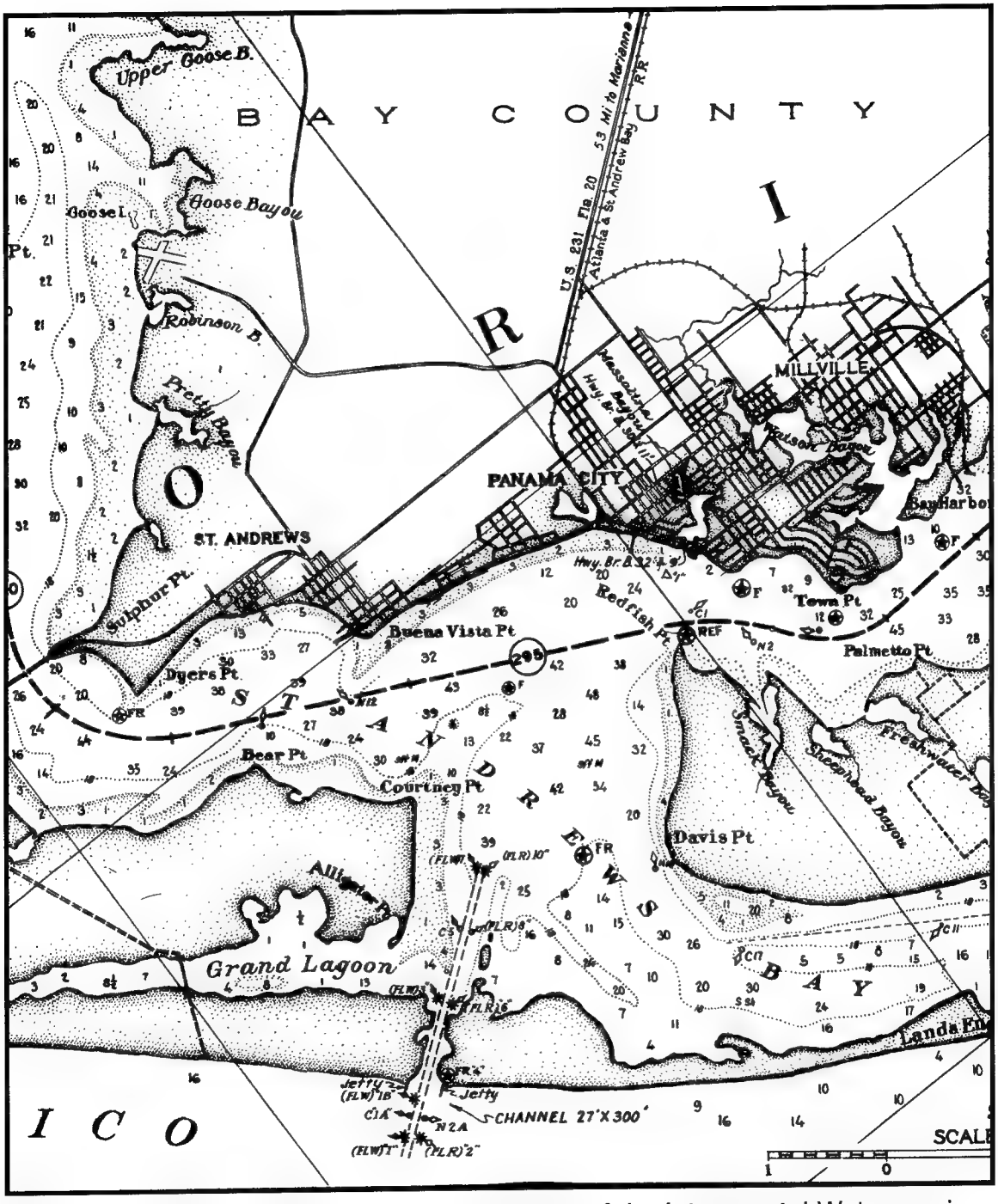

Figure 3. Portion of 1937 U.S. Engineers Map of the Intracoastal Waterway in St. Andrews Bay.

years, the eastern edge of this island has moved progressively landward about 2,100 ft (Doyle et al. 1984:74).

The beaches west of the jetties have retreated landward 97 to 127 ft since 1856, with the most extensive erosion occurring just west of the west jetty. Estimates from the COE indicate that more than about seven ft per year of landward retreat has occurred in this area since construction of the jetties in 1934. After 1943, the dredge spoil was deposited offshore about 1.25 mi, helping to slow retreat of the shoreline (Doyle et al. 1984:74-75; USDC NOS 1993).

Cultural Setting: Background and Archival Survey

The historic period settlement and development of St. Andrews Bay has been closely tied to waterborne transportation and commerce and the Gulf of Mexico, with settlers traveling by boat to Pensacola, Apalachicola, and other coastal communities for goods and supplies. Fishing, always a source of income, has became a major industry. Overland transport for commercial development was difficult until the coming of the railroads and improved road construction in the early 20th century, therefore, both visitors and residents on St. Andrews Bay were dependent upon a variety of different vessel types to support their interests and transportation needs.

Ferry boats operated from North and East Bays into St. Andrews Bay and West Bay for delivering freight and timber products (Surber 1950:98). Schooners and sloops were the principal sailing rigs used for fishing and coastal transport of passengers and goods, and were popular as pleasure craft. Steamboats traveled from New Orleans via Mobile to Tampa, with stops at Pensacola, St. Andrews, and Apalachicola, and the smaller class of both steam and sailing vessels worked the correspondingly smaller waterways. With the advent of gasoline power, utility as well as pleasure craft became motor driven. By 1914, a trade pamphlet boasted 400 motor boats in operation on St. Andrews Bay (Panama City Chamber of Commerce 1915). For more than 100 years, many versions of canoes, skiffs, and flatboats were used for lightering goods and people across shoal waters. With this history of intensive boat use, the potential for shipwrecks in St. Andrews Bay is considerably high, particularly for vessel losses from the early 20th century.

An abbreviated list of vessels reported lost in the vicinity of St. Andrews Bay follows. These are primarily large commercial craft; the numerous incidents of small craft losses are usually overlooked in references to vessel losses. Note that, except for the *Percy Payne*, these losses are reported at the old pass to St. Andrews Bay, offshore, or in the Bay outside of the survey area.

Shipwrecks Reported Lost Offshore from St. Andrews Bay

Albatross - Schooner of Pensacola, 12 tons, sailing from Pensacola for St. Andrews Bay, drifted into the breakers at St. Andrews after losing her sails during a storm, June 3, 1882 (Singer 1991:32).

H.A. DeWitt - Schooner of New York, 227 tons, found stranded and abandoned, four mi east of St. Andrews Bay, August, 1891, while traveling with a cargo of Mexican cedar (Singer 1991:32).

Mary Potter - Schooner of Pensacola, 36 tons, built in 1866, was fishing when became waterlogged and beached during a storm seven mi east of the east pass of St. Andrews Bay, February 5,1896 (Singer 1991:34).

Willena - Sidewheel gas vessel, 50 tons, built in 1907, stranded on St. Andrews Bar, January 28, 1910 (Singer 1991:39).

Carrie B. Welles - Schooner of Pensacola, 41 tons, 66.2 ft x 18.7 ft x 7.8 ft; built in 1891 in Maine; stranded at Hurricane Island, off St. Andrews Bay, August 9, 1913 (Singer 1991:39).

Robert A. Snyder - Schooner, 375 tons, 138.4 ft x 33.1 ft x 10 ft; built in 1891 at Milford, Delaware; stranded on St. Andrews Bay, September 14,1917 (Singer 1991:40).

Annie and Jennie - Gas vessel, 34 tons, built 1901, stranded on St. Andrews Bar, January 7,1918; four lives were lost (Singer 1991:40).

Cornelius H. Callaghan - Schooner, 1,341 tons, 206 ft x 40.7 ft x 16.5 ft; built 1916, stranded on St. Andrews Bar, January 10, 1924 (Singer 1991:42).

Alpena - Schooner, 970 tons, built 1901 at Port Blakeley, Washington, foundered in St. Andrews Bay, December 4, 1924 (Singer 1991:42).

Tecumseh - Gas vessel (formerly a schooner), 41 tons, built in 1899 at Essex, MA, 65.8 ft x 18.8 ft x 8.8 ft. Stranded in St. Andrews Bay, October 24,1929 (Singer 1991:44).Percy Payne - Schooner sunk in 1916 about 300 ft offshore Shell Island off the St. Andrews park beach, west of the west jetty. The hull timbers are periodically exposed by migrating sand (Grizzard 1987:5).

Tugboat Simpson - located outside of the mouth of St. Andrew Bay, off of the old pass, this vessel foundered and capsized while attempting to free a grounded fishing vessel during rough weather October 28, 1929. Abandoned by the crew and never salvaged, the stack remained visible on calm days through the 1970s. The wreck is another popular dive site in the Panama City area (Grizzard 1987:30).

The Florida Bureau of Archaeological Research was consulted for previous cultural resources work in Bay County, as well as a listing of prehistoric and historic sites. Although more than 700 sites are listed in the county, only one shipwreck site is recorded in the site files. Reported on in 1981, the beached wreck was assigned site number 8BY41, and is known as the Escape Motel Shipwreck. Tentatively interpreted as an 18th century British vessel, the remains included tarred rigging, gun ports with chain, and several cannon (with one remaining in its carriage). This site lies outside and to the west of the survey area.

Dr. Roger Smith, Florida state underwater archeologist, Mr. Doug Hough, the director of the Man and the Sea Museum in Panama City, and Ms. Dottie Gibbens and Mr. Jerry Nielsen, archeologists with the Mobile District Army Corps of Engineers, provided numerous sources for investigation of the history and shipwrecks in St. Andrews Bay. Derek Hemenway guided me through the site files and reports at the Bureau of Archeological Research in Tallahassee. References and maps in the Florida room at the Florida State Library, archival materials and other documents at the public library in Panama City and the library of the Gulf Coast Community College were reviewed.

Other reference sites include the libraries of the Army Corps of Engineers, Mobile and Galveston Districts, the Louisiana State University and Hill Memorial Libraries at Baton Rouge, Louisiana, and the Rosenberg Public Library and the Texas A & M Library, Galveston, Texas.

NOS navigation charts, historic maps of St. Andrews Bay, and 20th century U.S.G.S. topographic maps were examined to note cultural and topographic features. Aerial photographs of Bay County dating from the 1950s, 1970s, and mid 1980's, on file at the geology library at Florida State University in Tallahassee, showed no evidence of a wreck in the vicinity of the reported schooner, *Percy Payne*. Standard shipwreck references, e.g. NOS AWOIS (1991a; 1991b), Berman (1972), CEI (1977), the files compiled by Garrison et al. (1989a) on shipwrecks of the Gulf of Mexico in both state and federal waters (based on extensive review of primary and secondary references, including newspapers), and the WPA cross-referenced volumes on ships registered in the port of New Orleans (WPA 1942) were consulted for listing of the *Percy Payne*.

No information was available in any of these previous investigations, histories or lists regarding the schooner *Percy Payne*. Its single published reference is as a dive site for recreational scuba divers (Grizzard 1987, 1994). Unknown to any of the archeologists or historians of the Florida Division of Historical Resources, the wreck was reported to the Mobile District Corps of Engineers in 1991 by Mr. Emmett Foster of the Florida Department of Environmental Protection and Mr. Steve Martin, Cultural Resources Manager from the Florida Department of Environmental Protection, Recreation and Parks Division (Ms. Dottie Gibbens 1994: personal communication).

Telephone conversations with these two gentlemen (Foster 1994; Martin 1994) revealed that they observed the wreck as a feature on a 1980s aerial photograph of the beach at St. Andrews Park. This photo was submitted to the Florida Department of Environmental Protection by the COE for response to a proposed beach renourishment project. Neither of these gentleman were able to find their notes referring to the identity of this vessel, or were able to name their source for the identification of this target.

Mr. Danny Grizzard is author and publisher of the booklet, *Scuba Panama City*, now in its second edition, and currently being revised to include the liberty ship reefs. Formerly an operator of a diving charter business, he is an experienced diver familiar with the Panama City area. When interviewed by telephone (December 1994), he noted that his former partner and co-author of the first edition of this booklet was a professional diver, bridge inspector, and wreck aficionado who had been responsible for identifying and providing the historical background on the wreck sites described in the booklet, including the *Percy Payne*. This unnamed partner has since died, and none of his notes or references were available for review. His source for identification of the wreck site remains unknown.

Mr. Grizzard was not sure when the wreck site was discovered, but observed that for the past 10 years it has been a popular beach dive for local Scuba instructors. Corresponding with the migration of the nearshore bars, the wreck is seasonally exposed then recovered. He noted that brass fasteners had been the primary artifacts salvaged from the vessel.

In researching the settlement and development of St. Andrews Bay, I found that a number of historical accounts had been compiled over the past 16 years from cultural resources investigations. Of particular help were the historical documents study of the Naval coastal systems Center, Bay County, Florida, prepared by Mildred Fryman (1979), the historical chronology developed by Eric D. Montgomery for the Panama City Historic Sites Survey (1987), and supporting original documentation on file at the Florida Room at the Florida State Library in Tallahassee and at the Bay County Public Library in Panama City. The following chronology was drawn largely on these previous studies, supported by the original documents referenced by these previous authors.

The Historic Period - A Chronology

The earliest European interest in west Florida focused on exploration of the coasts by the Spanish in the 16th century. Land exploration followed during the next centuries, with little impact on the St. Andrews Bay area. The bay itself probably received its name from the saint's day on which it was first visited (Fryman 1979:128). Spanish interests in colonization focused elsewhere.

The earliest settlement on St. Andrews Bay was reported at Dyer's Point, during the First Spanish Period or Spanish Mission Period (1565-1763), probably about 1754, when a small settlement with cottages and gardens was noted in a letter published several years later by its author, Thomas Robinson (Fryman 1979:128). This site later became the western portion of the small town of St. Andrews. By the 1760s, a tiny settlement of Wells was reported on maps from St. Andrews Bay. Its true identity and location remain problematical because maps from the British and second Spanish Periods place this name at different locations on the bay, ranging from the west side near the present day Naval Coastal Systems Center to the eastern arm of St. Andrews Bay. Niles F. Schuh, a local historian, has examined these inconsistencies and theorizes that the name could refer to freshwater springs noted by 18th century mariners (Montgomery 1987:28; Fryman 1979:129-130).

Settlement was minimal around St. Andrews Bay during the beginning of the American Period when Florida became a territory of the United States in 1821 (Carswell 1991:352). In 1822 the original county of Escambia was divided, with Jackson County formed including the region of St. Andrews Bay. Further subdivisions occurred in 1825 when St. Andrews Bay became part of Washington County, which it remained a part of for the next 88 years. From more prosperous settlements elsewhere in western Florida, Alabama, and Georgia, came visitors to the seasonal resort community known as St. Andrews that developed on the east side of the bay in the first part of the 19th century (West 1960:50; St. Andrews-By-The-Sea 1886; Fryman 1979:131). Fishing afforded an economic base for the more permanent residents along the bay. The sawmilling industry also became established along the shores of the bay (Carswell 1991:251).

The first American survey by the government of the public lands was conducted in 1847. With the government retaining much of the acreage in pine forest for military naval stores and sawmilling, little settlement was encouraged until after the Civil War (Fryman 1979:131).

Settlers in Washington County displayed mixed loyalties and indifference to the war and its causes (Carswell 1991:107-108). Pro-Union sympathizers rallied around the Union forces at Santa Rosa Island and were organized into the First Florida Cavalry. Fringed by heavy woods, the many arms of St. Andrews Bay afforded an ideal haven for blockade runners during the first part of the war. These vessels entered the bay at the old pass near Hurricane Island. Swift little schooners brought coffee, as well as less practical items such as women's fancy attire, leaving with cargoes of cotton.

The area became a primary source of salt production throughout the war (Carswell 1991:108) and exemptions from military service in the Confederate army were given to any who agreed to engage in the salt-making activities along

the coast. Numerous salt production flats were established along the heads of the bays and on the lakes and inlets to avoid confrontations with the Federal gunboats. Unfortunately, the production areas were marked by smoky fires and drew the attention of the Union forces. From 1862 to 1863, raids on the coast resulted in the destruction of equipment, boilers, and flatboats and sloops supporting more than 500 salt making sites at St. Andrews and up along North Bay (Carswell 1991:122-123).

In 1864, the locals rebounded, and by May, more than 200 salt works were reported along the Bay. However, continuing action by the Union squadrons blocked the arrival of badly needed goods, and raids on what may have been the South's major salt works led to the abandonment of the industry by February, 1865.

Reconstruction was slow in west Florida, and few residents remained along the shores of St. Andrews Bay in the first years following the end of the war. No roads led to the area, fishing was the predominant occupation, and the Gulf of Mexico afforded the only effective route to market. In 1870, the county of Washington was populated by only 2,302 people, 84 per cent of whom were white (Montgomery 1987:43).

The 1880s was a boom period for land speculators across Florida, and the timber and fisheries of St. Andrews Bay and Washington County drew the interest of the St. Andrews Bay Railroad and Land Company, organized in Cincinnati, Ohio (St. Andrews Bay Railroad and Land Company 1886). Known as the "Cincinnati Company," they were quick to promote "St. Andrews Bay by the Sea" to midwesterners. They claimed the largest oyster bed in the world and favorable soils for "fruits, vegetables, nuts, canes, roots, fodders and fibrous growths", and were acknowledged for the increasing immigration to Washington County (St. Andrew Bay Railroad and Land Company 1886).

In 1900, St. Andrews was more than a prosperous little village, growing with settlers arriving overland as well as by schooner and steamboat from Pensacola and other cities on the Gulf of Mexico (Montgomery 1987:52). Five years later, another land company formed, the Gulf Coast Development Company, and in another five years, it had established the town of Panama City. Named for the Panama Canal, the company had plans to become a major port and outlet on the Gulf of Mexico. The founders of the Gulf Coast Development Company, men from Chicago and Georgia, pushed for the construction of a railroad line to St. Andrews, which would provide a vital transportation link from the manufacturers to the north to ships in the port of Panama City. The poor condition of the few existing roads and the absence of a railroad prior to 1908 certainly had a numbing affect on the development of the area as little more than a resort.

The construction of an ice plant in combination with the arrival of the Bay Line Railway provided a setting for vigorous expansion of the fishing industry. The new refrigeration techniques allowed fresh seafood to be shipped to markets in the north and west. In 1909, the town incorporated; and in the same year, an investigation into the practicality of a continuous waterway along the Gulf of Mexico from St. George Sound, Florida, to the Mississippi River at New Orleans was directed by Congress. A year later the River and Harbor Act of June 25, 1910, was adopted and the channel at eastern end of Shell Island was deepened (Figure 2), introducing an era of dredging to maintain deep water navigation, in protected waters where possible, along the Gulf of Mexico (Chief of Engineers Annual Reports 1938-1979).

By 1913, Panama City become the county seat for the newly formed Bay County. With moderate growth and a natural, protected deep-water harbor, by 1918 the city had become the shipping point for an extensive fishing and oyster industry, as well as a distribution center for fruit and truck garden produce (Montgomery 1987:70). The principal commerce through the port consisted of cement, grain, fish, lumber, timber, naval stores, manufactured iron, and steel (COE 1917). Steamboats stopped three times weekly for connections to Mobile and had a weekly run to Apalachicola. For more than 23 years the Tarpon Steamship Company operated a dock at the mouth of Messalina Bayou. The sinking of the steamboat Tarpon offshore in 1937 brought the demise of a singular type of commercial passenger transportation to and from St. Andrews Bay.

During the 1920s, the little town of St. Andrews declined in population, while Panama City exhibited continued growth (Montgomery 1987:70). Roads were paved and improvements were recommended for promotion of tourism and industry to the area. However, the timber resources of the area began to decline during this period. In November 1925, in an effort to boost population and be attractive to new industry, the towns of St. Andrews, Panama City, and Millville were merged to form the municipality of Panama City. Industry responded when the International Paper Company decided to locate a new mill in Panama City in 1930, and the U.S. government established Tyson Air Station in the same year (Montgomery 1987:74-75).

Navigation improvements approved by Congress and implemented by the COE followed the local industrial growth and economic development. When the deepwater cut across Shell Island was opened in 1934, a channel 29 ft deep and 450 ft wide provided direct access to the bay from the Gulf (Figure 3). Two jetties, each about 700 ft long when initially constructed, protect the entrance from the Gulf. This channel has subsequently been deepened to 40 to 42 ft and the jetties lengthened to more than 2,000 ft in length (COE 1972). In 1938, the completion of the canal between Choctawatchee Bay and St. Andrew Bay opened the continuous waterway from St. George Sound to the Mississippi River in New Orleans. This navigation project continued to be supported by Congressional

authorization in 1935, 1945, 1948, 1967, and 1972 (COE 1979). A draft environmental report from the COE in 1979 indicated that the average frequency of maintenance dredging along the waterway from West Bay to the Apalachicola River has been 15 days every 12 months (COE 1979:5).

World War II played a major role on development around St. Andrews Bay. The Navy established a base at Panama City, and the Air Force opened Tyndall Air Force Base in 1941 at Red Fish Point (Fryman 1979:144; Montgomery 1987:76; COE 1993). The decision to enter the war in 1942 accelerated the plans of the Maritime Commission (established in 1936) for refitting the U.S. merchant marine fleet. The need for large numbers of freighters resulted in a design especially adopted for mass construction and wartime service. A freighter class that could be modified to meet the needs of different operators, the Liberty ships were constructed to ease the tremendous adverse affect to shipping caused by the Germans (Bauer 1988:306-308). J. A. Jones Construction Company was contracted to build and operate the Wainwright Shipyard at Dyers Point, presently the location of the Port of Panama City (Green 1978). Eventually, there were more than 2,600 Liberty ships built during the war effort at shipyards around the country. Wainwright Shipyard constructed 108, 66 of which were standard ships fitted to carry cargo. The other 42 were modified for military use as transports of army tanks and boxed aircraft, and as T-1 tankers (Green 1978:20).

After the war, Wainwright Shipyard was closed, then subsequently purchased and operated by the city as the Port of Panama City. The military presence in the Panama City area continued during the late 1940s and 1950s, with Tyndall Air Force Base becoming an air tactical school (Montgomery 1978:76). The Naval Base was reactivated as the U.S. Navy Mine Countermeasures Station in July 1945. Further expansions came in the mid 1950s, when the station was redesignated the U.S. Navy Mine Defense Laboratory. After more than 40 years of changes in nomenclature to reflect expanding roles in research and development, the laboratory is currently referred to as the Coastal Systems Station, Dahlgren Division, Naval Surface Warfare Center (COE 1993).

Since the 1950s, Panama City has continued to support the military operations in the area, and develop their recreational and tourist resources, such as the bay system, St. Andrews State Park, and the beaches. The beaches have become a major tourist attraction and winter retreat.

CHAPTER 3 FIELD SURVEY AND RESULTS

Survey Methodology

Survey field operations commenced the morning of October 11, 1994, and were completed October 14, 1994. Adverse weather conditions and technical problems delayed actual data acquisition until Thursday, October 13, when the weather cleared and the magnetometer console was replaced. Barge and boat traffic in the vicinity of Dyers Point was minimal, but traffic was heavy through the pass during the mid-morning hours and late afternoon, with fishing vessels, pleasure craft, and military transports returning to dockside. Traffic through the pass and offshore was relatively light during the early morning of Friday, October 14, when the schooner site was surveyed. Bait boat activity running parallel to the shoreline increased in the mid morning, and their wakes and prop wash delayed acquisition.

The survey was conducted on board a 26-ft aluminum work boat powered by two 115 hp outboard motors. Differential GPS was used for horizontal positioning. The navigation data were displayed in real time allowing the helmsman to follow the preplotted survey lines. The geophysical instrumentation included an Odom Hydrographic Echotrac echo sounder recording digital and analog water depths, a GeoMetrics 801/3 proton magnetometer, and an E.G.& G. Model 260 Seafloor Mapping System operating at frequencies of 100 kHz and 500 kHz and interfaced to the navigation computer to provide slant range, vessel speed corrected seafloor images.

The survey grid is comprised of six sets of three primary lines, Lines 1-18, spaced about 75 ft apart. Lines 1, 4, 7, 10, 13, and 16 are the centerlines. Perpendicular tielines, Lines 1019-1024, were run at the beginning and end of each survey set. Lines 2026-2030 were acquired over the schooner site. Navigation fixes (event marks), which correspond with the position of the navigation antenna, were noted every 250 ft along all track lines. Line 17 was rerun as Line 3017.

Echo sounder, magnetometer and side scan sonar data were acquired along all of the survey lines, providing overlapping coverage of the channels with the sonar, continuous along-line profiles with the echo sounder and a representative sampling with the magnetometer.

The SMS sensor was towed from the bow with an offset of 21 feet forward of the navigation antenna. The magnetometer was towed from the stern with an offset of 200 ft from the antenna. In order to stabilize the magnetometer sensor, it was buoyed under styrofoam floatation, and oscillations ("swimming") dampened by a drogue attached behind the sensor. The Echotrac transducer was mounted at the navigation antenna, with a two-ft draft.

Shallow and variable water depths precluded deploying the side scan sonar towfish in the conventional manner, so the towfish was deployed from the bow of the vessel. The survey was begun with side scan sonar operating at 500 kHz, and Lines 1 through 8 were completed using this frequency. However, acoustic interference from boat noise degraded data at this frequency. Data on the remaining survey lines were acquired at 100 kHz with no boat-related interference.

The GeoMetrics Model 801/803 marine magnetometer operated at a one-second sample rate. An analog field record was displayed at 100-gamma and 1,000-gamma scales. Digital data were recorded, processed and integrated with positioning data by the JECA navigation computer onboard. The background noise level was one to two gammas peak-to-peak.

The offsets from the positioning antenna were considered for magnetometer and sonar data reduction and interpretation. The echo sounder, magnetometer and positioning data were post processed using the Terramodal contouring software and the resulting bathymetric and magnetic contour maps are presented in Appendix B.

Bathymetry

The echo sounder profiles record a relatively smooth, uniformly sloping bottom in the western arm of the project area near Dyers Point. As the channel trends to the southeast, low ripples merge into the large waves on the bottom of the pass cutting Shell Island.

The digital echo sounder data were adjusted to compensate for the transducer depth and corrected for tidal fluctuations. The water column sound velocity was averaged to 5,000 ft per second and soundings were converted from two-way travel time to depths in feet. Soundings were logged with positioning data in the JECA navigation computer.

A bathymetric contour map at a horizontal scale of 1:2400 and a 1-ft contour interval is included in Appendix B as Bathymetric Contour Map, Sheets 34 through 66.

Side Scan Sonar and Magnetometer Data Analysis

The side scan sonar data record variations in bottom reflectivity that correlate with sediment and seafloor textural changes across the area. An acoustically smooth, moderately reflecting seafloor characterizes the western portion of the bay off Dyers Point, which trends into small ripples on the inner side of the Gulf approach. Large sand waves mark the pass through Shell Island (Figure 4). Water column anomalies from boat wakes, prop wash and fish are common.

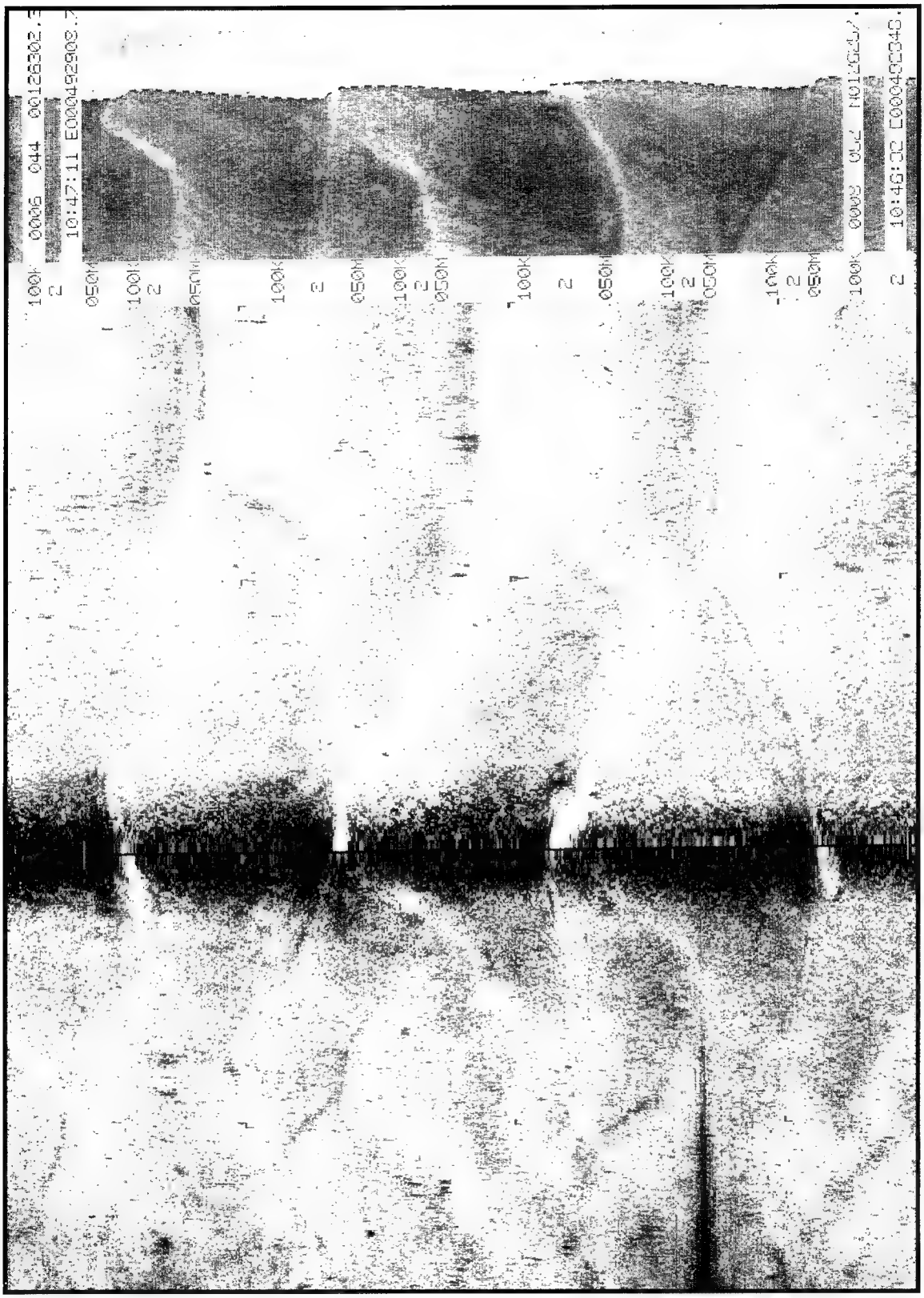

Figure 4. Side scan sonar from survey line 17 showing large sand waves in the Gulf approach channel

Some water column debris, such as seaweed or other flotsam, was noted at the water surface during data acquisition.

The data show a seafloor unusually clear of bottom debris, compared with data from Galveston and Mobile Bays, and offshore areas of Alabama, Louisiana, and Texas (Irion and Bond 1984; Irion 1986; Arnold 1987; James 1991; Garrison et al. 1989a; Landry 1992). Identifiable features in the data include offline reflections from the channel marker buoys and passing and anchored vessels; anchor drag scars are common in the vicinity of Dyers Point.

Five unidentified targets were recorded in the data. These are listed and described in the Table of Side Scan Sonar Targets in Appendix A. Reproductions of these targets are presented as Figures 5, 6, 7, and 8.

Sonar targets 1 and 2 are recorded on Line 9 (Figure 5); both targets were confirmed on the adjacent Line 7. The absence of magnetic anomalies indicates that neither is ferrous. Target 1 may represent a timber. The triangular target, Target 2, is perplexing in its shape and size: each side is about 10 m (32.8 ft) long. Its image is similar to impressions made by mats for drilling rigs, although its shape is different. Although neither target can be identified, they are not interpreted as possible shipwreck remains.

Target 3, reproduced in Figure 6, is a patch of speckled strongly reflecting bottom covering an area about 17 m^2 (55.76 ft^2). This feature was not recorded on the adjacent lines 10 or 11, although anchor drag scars in the area correlate. Similar targets have been observed as water column anomalies representing schools of fish.

Target 4 is in the pass to the port side of Line 16 (Figure 7). A striated rectangular feature about four m^2 (13.12 ft^2), with two linear arms, it was vaguely verified on Line 18 as a similarly shaped, more homogeneously reflecting target. It could represent a piece of decking, either from houses downed in recent storms or a vessel, or possibly a portion of a shrimp trawl door and rigging.

Target 5 was confirmed on Line 17 and 3017 as a linear target, parallel to the channel axis, about 9 m (29.5 ft) long, and a meter (3.28 ft) wide (Figure 8). Nonferrous, it is probably a log or pole.

There are 22 magnetic anomalies recorded in the navigation channel. Seven correlate with identified features, such as buoys, passing vessels, the industrialized shore at Dyers Point, and resort development at Alligator Point. There are 15 magnetic anomalies that remain unidentified. All of the anomalies are listed and described in the Table of Magnetic Anomalies in Appendix A. The digital magnetic data were correlated to positioning data in post processing and

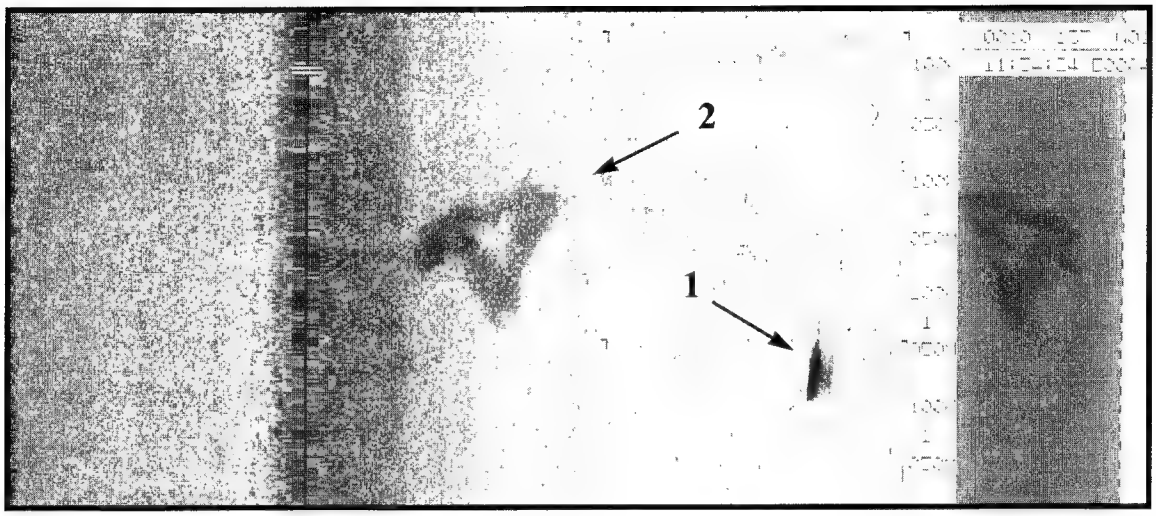

Figure 5. Side scan sonar targets 1 and 2 on survey line 9

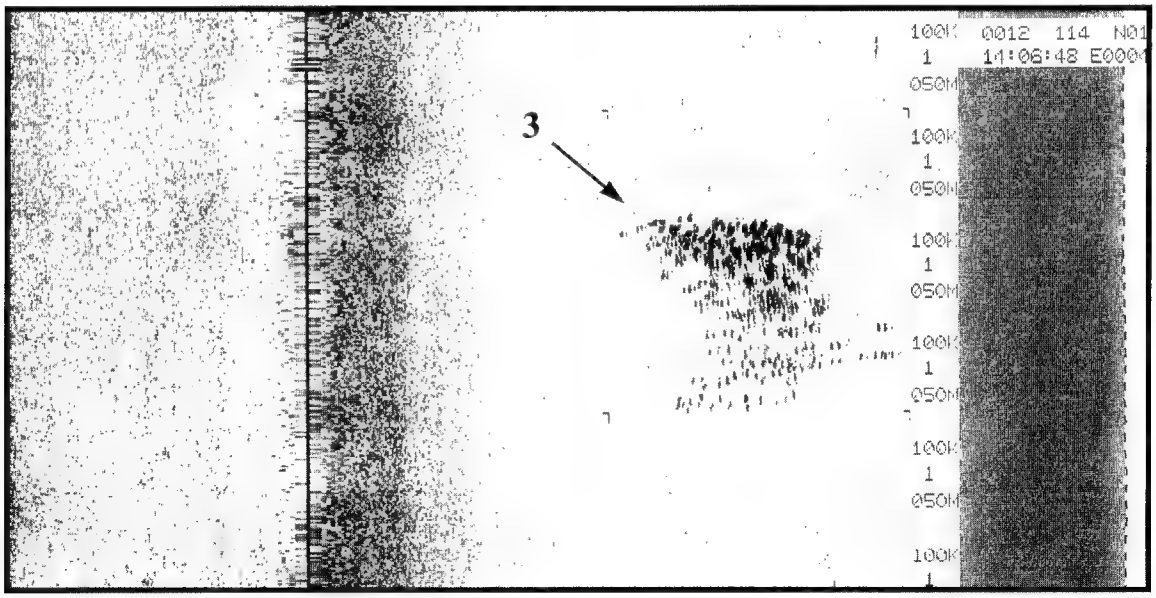

Figure 6. Side scan sonar target 3 on survey line 12

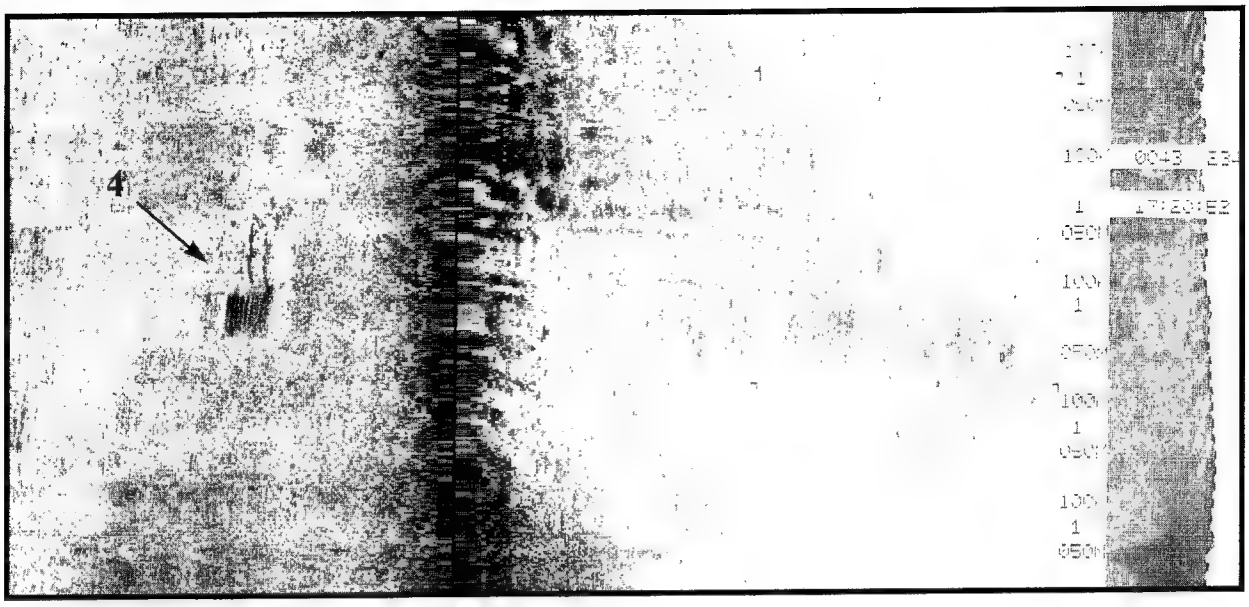

Figure 7. Side scan sonar target 4 on survey line 16

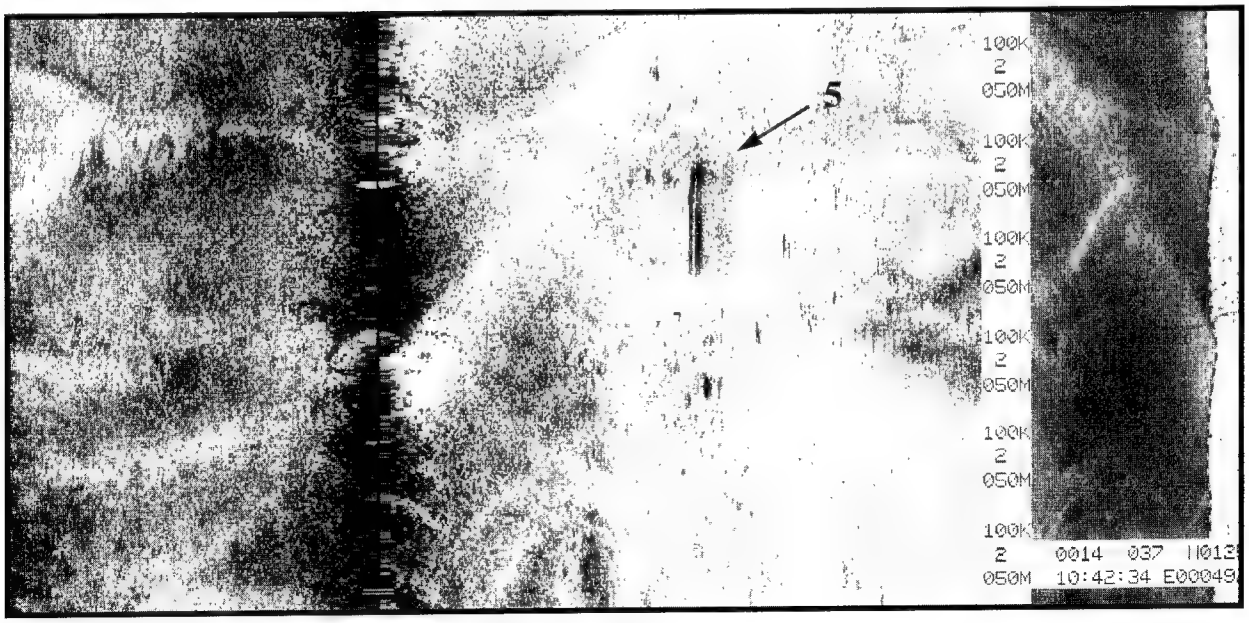

Figure 8. Side scan sonar target 6 on survey line 17

a magnetic contour map generated at a horizontal scale of 1:2400 with a 10-gamma contour interval. These data are included in Appendix B as Magnetic Contour Map, Sheets 1 through 33 .

The magnetometer recorded occasional increases in background noise that corresponded with changes in vessel speed, passing boats, and electrical interference from cables in the vicinity of St. Andrews State Park and Alligator Point.

An examination of the character and distribution of the unidentified magnetic anomalies indicates that most of them are isolated, low amplitude, short duration features. This type signature is indicative of small, point source objects whose positions are close to the sensor (Breiner 1973). Such objects can include short sections of cable or chain, pieces of metal decking, or buoy weights, rather than buried steam engine components or metal vessel hulls. Similar anomalies have been tested elsewhere that proved to represent modern debris, rather than shipwreck remains (Irion and Bond 1984; Irion 1986; James 1991). None of the magnetic anomalies correlate with sonar targets, which suggests that they represent objects too small to be resolved by the sonar or embedded in the seafloor sediments

While most of the anomalies are isolated features, two clusters can be delineated: one off Dyers Point and the other at the Gulf side entrance to the pass through Shell Island. The anomalies off Dyers Point are associated with a number of anchor drag scars, reflecting recent docking or anchoring of vessels at this location. The anomalies are all low amplitude, less than 10 gammas, and are interpreted as probable modern debris.

The anomalies at the Gulf entrance may represent debris from construction and maintenance of the jetties or channel markers. The sonograms indicate large sand waves in this area, which migrate seasonally over the bottom. No wrecks have been reported in this area since the pass was initially dredged in the 1930s. In consideration of the continual dredging operations since then, it is not unlikely that the magnetic anomalies recorded at this location represent modern debris.

The remaining anomalies are randomly scattered, isolated features. Their signatures and distribution suggest they represent modern debris.

No specific evidence for shipwreck remains was observed in the high resolution geophysical data where dredging activities are proposed.

Survey of the Schooner, Percy Payne

The site of a shipwreck previously reported as the schooner *Percy Payne* was surveyed the morning of Friday, October 14, 1994. Coordinates for the wreck

Figure 9. Side scan sonar image from the reported *Percy Payne* wreck

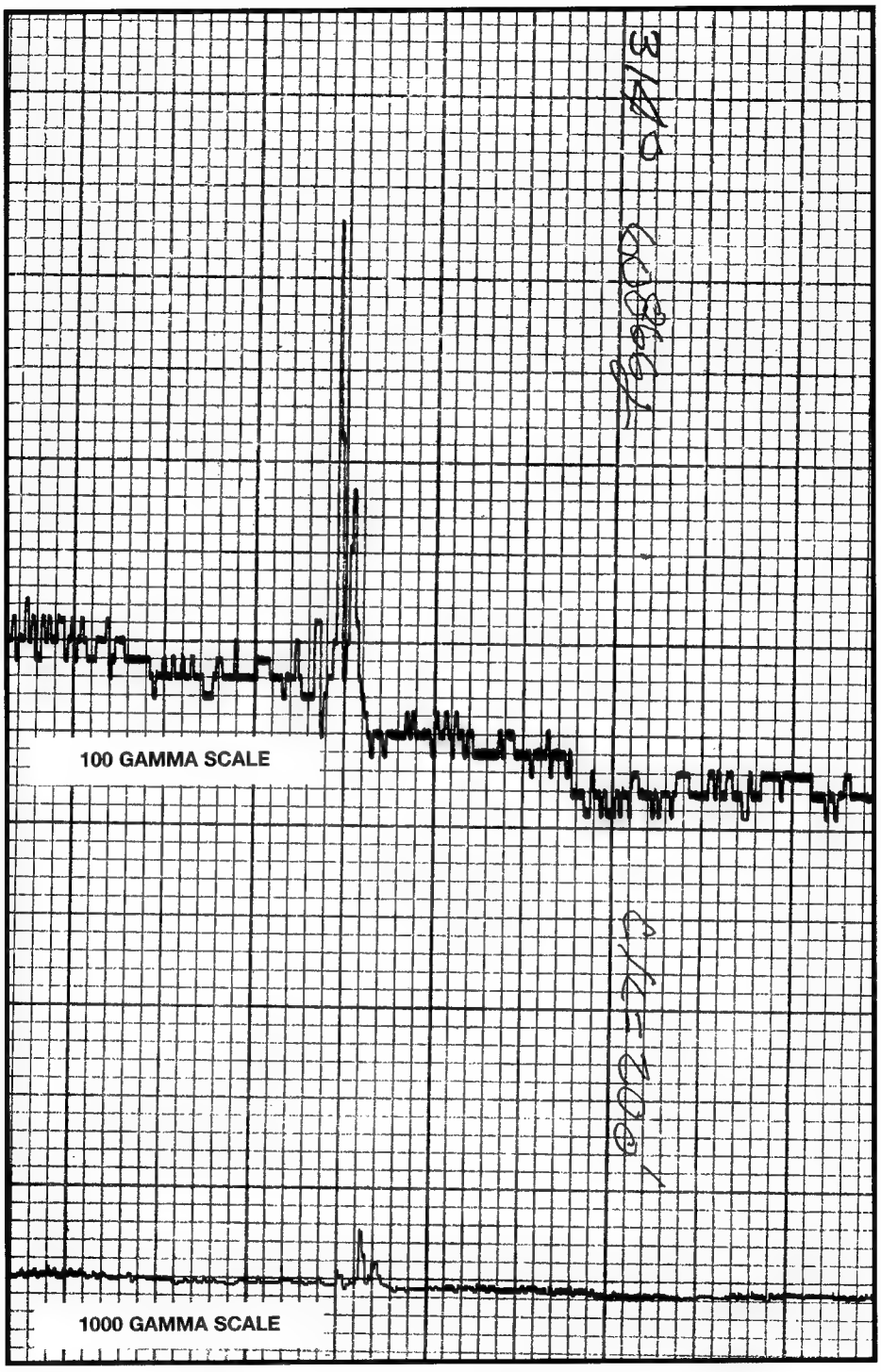

Figure 10. Magnetic anomaly of 29 gammas from the reported *Percy Payne* wreck

were initially derived from an aerial photograph provided by the COE, and the preplotted survey lines were based on these coordinates. Large swells and shallow water depths mandated running the survey lines parallel to the shoreline.

The wreck site appears in the sonar data as a relatively large, strongly reflecting bottom feature, 45 m (147 ft) long by 15 m (49 ft) wide, exhibiting no relief above the seafloor (Figure 9). A single, relatively short duration, dipolar, 28-gamma to 29-gamma magnetic anomaly was consistently recorded over the site, indicating little ferrous material is associated with it (Figure 10). Magnetic contours and bathymetry of the site are shown on Sheets 33 and 66 in Appendix B. No other side scan sonar targets or magnetic anomalies appear in the vicinity of the site.

The coordinates of the reported wreck of the schooner *Percy Payne* have been provided to the Mobile District and the Florida State Historic Preservation Officer.

CHAPTER 4 SUMMARY AND RECOMMENDATIONS

The analysis of the high resolution geophysical data gathered during the October 1994 survey of the existing navigation channel in St. Andrews Bay and the Gulf approach pass indicate that no significant channel bottom targets or magnetic anomalies were recorded within the proposed dredge site. None of the unidentified magnetic anomalies exhibit characteristics suggestive of buried shipwreck or other historic remains. None are considered to be significant. None of the five sonar targets are interpreted as possible shipwreck remains. No references were found to sunken vessels being encountered during previous dredging activities. The presence of these unidentified features within the channel suggests that all of them probably represent modern debris. The absence of any significant features reflects more than 60 years of continuous dredging in this area.

The shipwreck site, reportedly that of the schooner *Percy Payne*, while appearing to be poorly documented historically, is a popular recreational scuba dive site that is periodically exposed by the shifting nearshore sands. With the vessel apparently sunk hull up, little material appears to have been salvaged from it. Visitation to the site appears to be more of a training and visual experience for scuba divers, rather than any sort of recent salvage or vandalization effort. Informants report that no significant artifacts aside from brass hull fasteners have been recovered from the site.

At the time of the survey, portions of the hull were exposed as more strongly reflecting bottom targets with no relief above the seafloor. The short duration, 28-gamma to 29-gamma anomaly recorded consistently over the wreck suggests that little ferrous debris is associated with this wooden-hulled vessel. If the wreck is in fact that of a schooner, such a small anomaly could be in keeping with the amount of iron typically represented in a sailing rig of that class. The iron components would be comprised of the anchor, chains, various fastenings, and possibly the pumps of the vessel. The latter also could have been wood. A small auxiliary engine also could be present.

The wreck site appears to be relatively secure from vandalism, and is apparently not of interest to treasure salvors. Although in an area subjected to erosion by migrating sands, the site appears to be minimally exposed most of the year.

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APPENDIX A

Table 1. Table of Magnetic Anomalies

Line Number	M/V Fix	Sensor Fix	Amplitude in Gammas	Duration in Feet	Signature*	Remarks
1	10.80	10.00	11	60	M	Unidentified
1	11.60	10.40	15	4	M	Unidentified
1	13.50	12.70	5	350	M	Unidentified
2	10.20	11.00	16	50	M	Dyer's Point Terminal
2	9.40	10.20	8	550	M	Shipyard Ways
2	6.30	7.10	11	150	M	Unidentified
7	7.30	6.50	6	20	D	Shrimp Boat
10	33.40	32.60	7	10	M	Unidentified
10	46.45	45.65	8	40	D	Unidentified
10	57.15	56.35	5	20	M	Unidentified
11	65.25	66.05	4	10	M	Unidentified
11	31.80	32.60	4	30	M	Unidentified
11	30.85	31.70	4	20	M	Unidentified
11	15.15	15.95	7	10	D	Buoy
15	17.50	16.70	4	30	D	Buoy
16	42.00	41.20	5	20	M	Unidentified
16	47.10	46.30	5	10	M	Unidentified
17	45.50	46.30	28	120	M	Unidentified

* M=monopolar; D=Dipolar

Table 1. Table of Magnetic Anomalies Continued

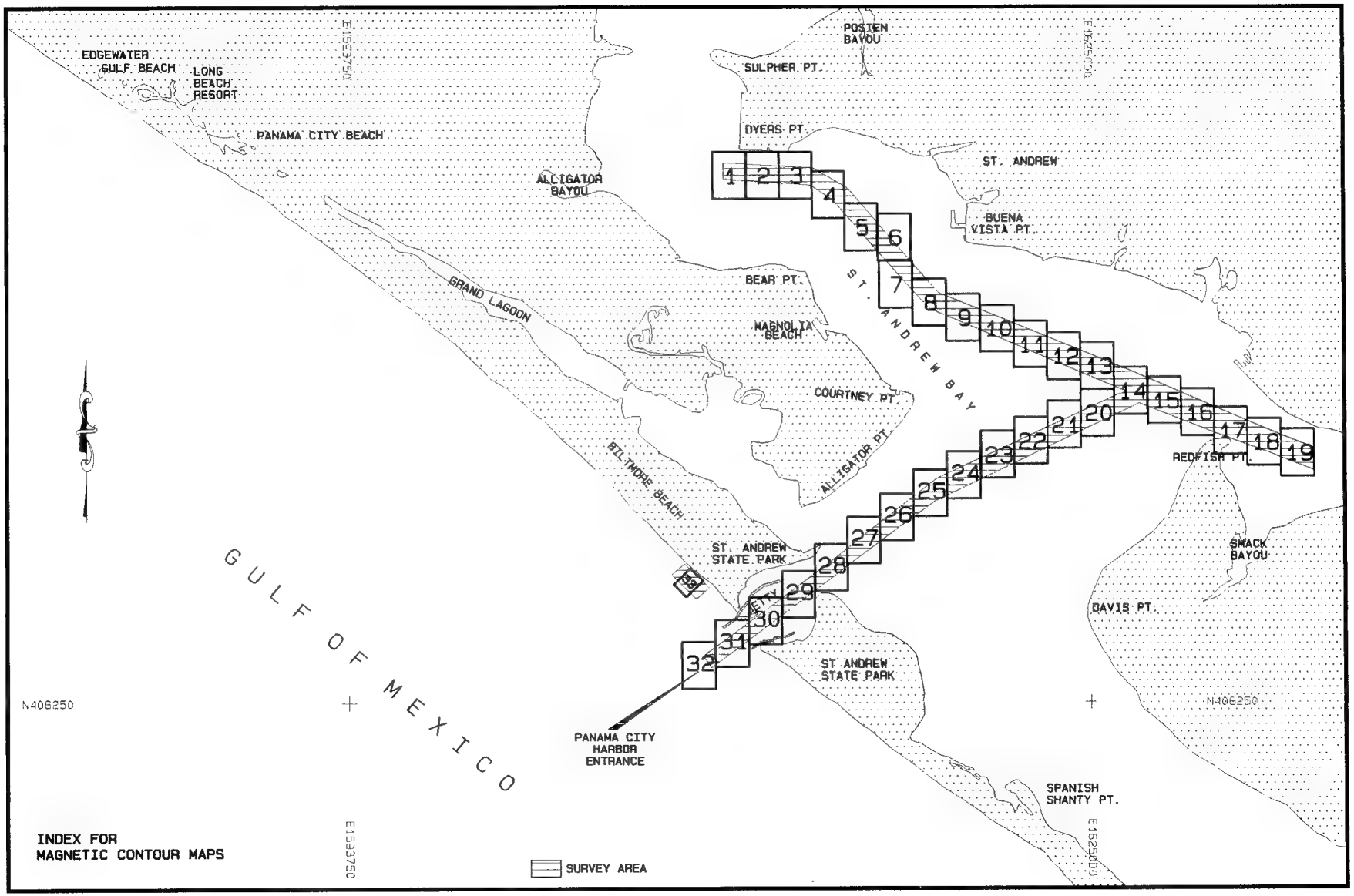
Line Number	M/V Fix	Sensor Fix	Amplitude in Gammas	Duration in Feet	Signature*	Remarks
17	39.40	40.20	11	40	M	Unidentified
17	38.60	39.40	7	20	M	Unidentified
17	11.70	12.50	95	60	M	Unidentified
18	7.60	6.80	5	40	M	Unidentified
3017	36.50	37.60	75	70	D	Cable Crossing
3017	15.00	15.80	43	520	M	Development at Alligator Point
1019	3.30	2.50	4	30	M	Unidentified
1019	5.00	4.20	6	100	M	Unidentified
1022	1.50	2.30	11	200	M	Buoy
1024	3.80	3.00	7	40	M	Unidentified

* M=monopolar; D=Dipolar

Table 2. Table of Side Scan Sonar Targets

Target Number	Line Number	M/V Fix	Sensor Fix	Remarks
1	9	9.65	9.73	Linear target, 5m x 1 m; 42 m to starboard; no magnetic anomaly; Figure 5.
2	9	9.80	9.88	Triangular patch of higher reflectivity;10 m per side;10 m to 20 m to starboard; no magnetic anomaly; Figure 5.
3	12	11.70	11.62	Patch of speckled strongly reflecting bottom; 17m x 17 m; 25 m starboard; no magnetic anomaly; Figure 6.
4	16	42.85	42.93	Striated rectangular target; 4m x 4m; 15 m to port; 5 gamma magnetic anomaly; Figure 7.
5	17	13.60	13.52	Linear target; 9 m x 3 m; 25 m to starboard; no magnetic anomaly; Figure 8.

APPENDIX B


EDGEWATER GULF BEACH
LONG BEACH RESORT
PANAMA CITY BEACH
ALLIGATOR BAYOU
GRAND LAGOON
BEAR PT.
MAGNOLIA BEACH
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BILTMORE BEACH
ALLIGATOR PT.
POSTEN BAYOU
SULPHER PT.
DYERS PT.
ST. ANDREW
BUENA VISTA PT.
ST. ANDREW BAY
REDFISH PT.
SNACK BAYOU
DAVIS PT.
ST. ANDREW STATE PARK
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PANAMA CITY HARBOR ENTRANCE
SPANISH SHANTY PT.
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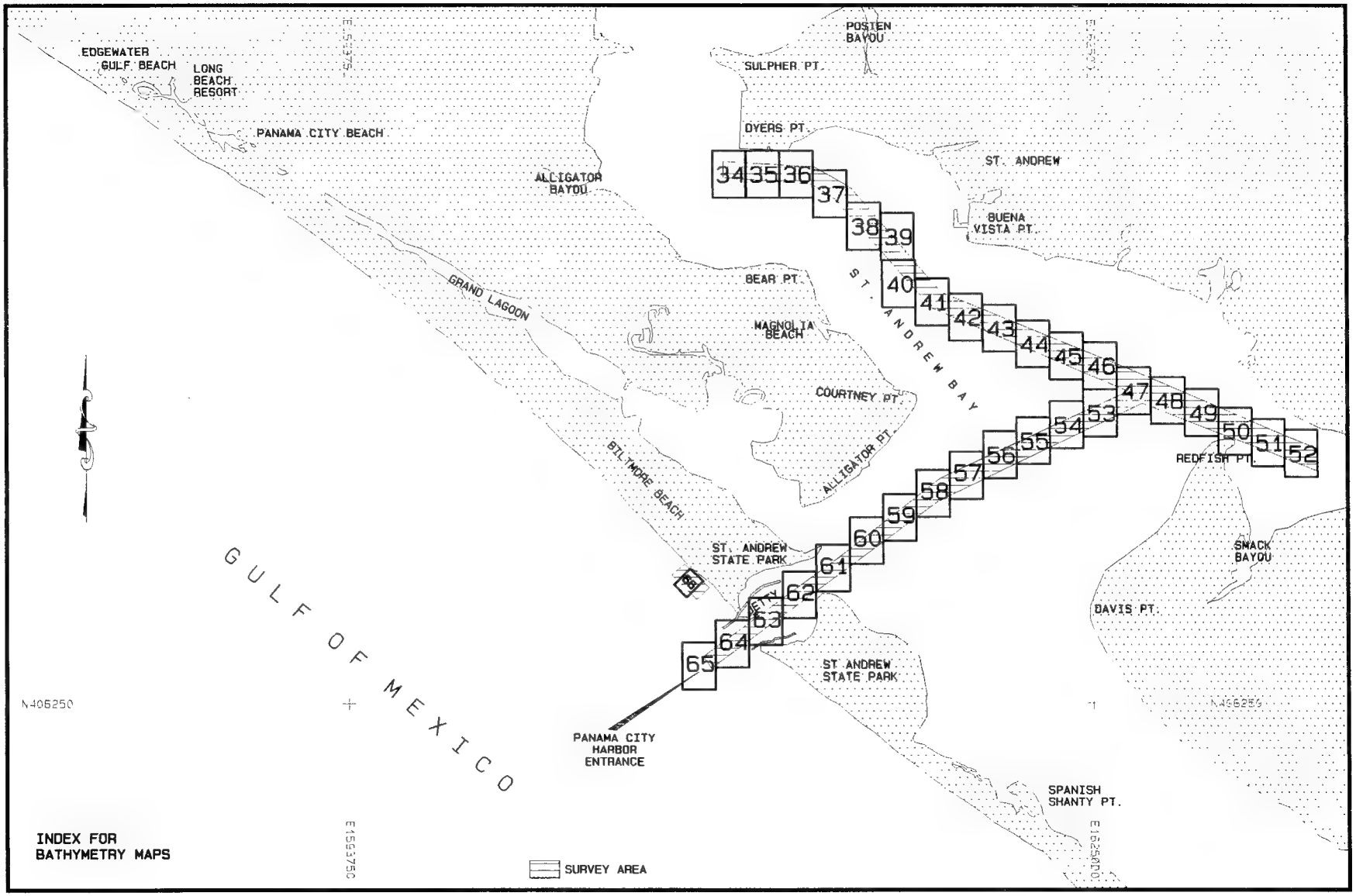
31
32
INDEX FOR
MAGNETIC CONTOUR MAPS
SURVEY AREA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LONG BEACH RESORT
PANAMA CITY BEACH
ALLIGATOR BAYOU
GRAND LAGOON
BEAR PT.
MAGNOLIA BEACH
COURTNEY PT.
ALLIGATOR PT.
BILTMORE BEACH
ST. ANDREW STATE PARK
POSTEN BAYOU
SULPHER PT.
DYERS PT.
ST. ANDREW
BUENA VISTA PT.
ST. ANDREW BAY
REDFISH PT.
SMACK BAYOU
DAVIS PT.
ST ANDREW STATE PARK
SPANISH SHANTY PT.
PANAMA CITY HARBOR ENTRANCE
GULF OF MEXICO
34
35
36
37
38
39
40
41
42
43
44
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47
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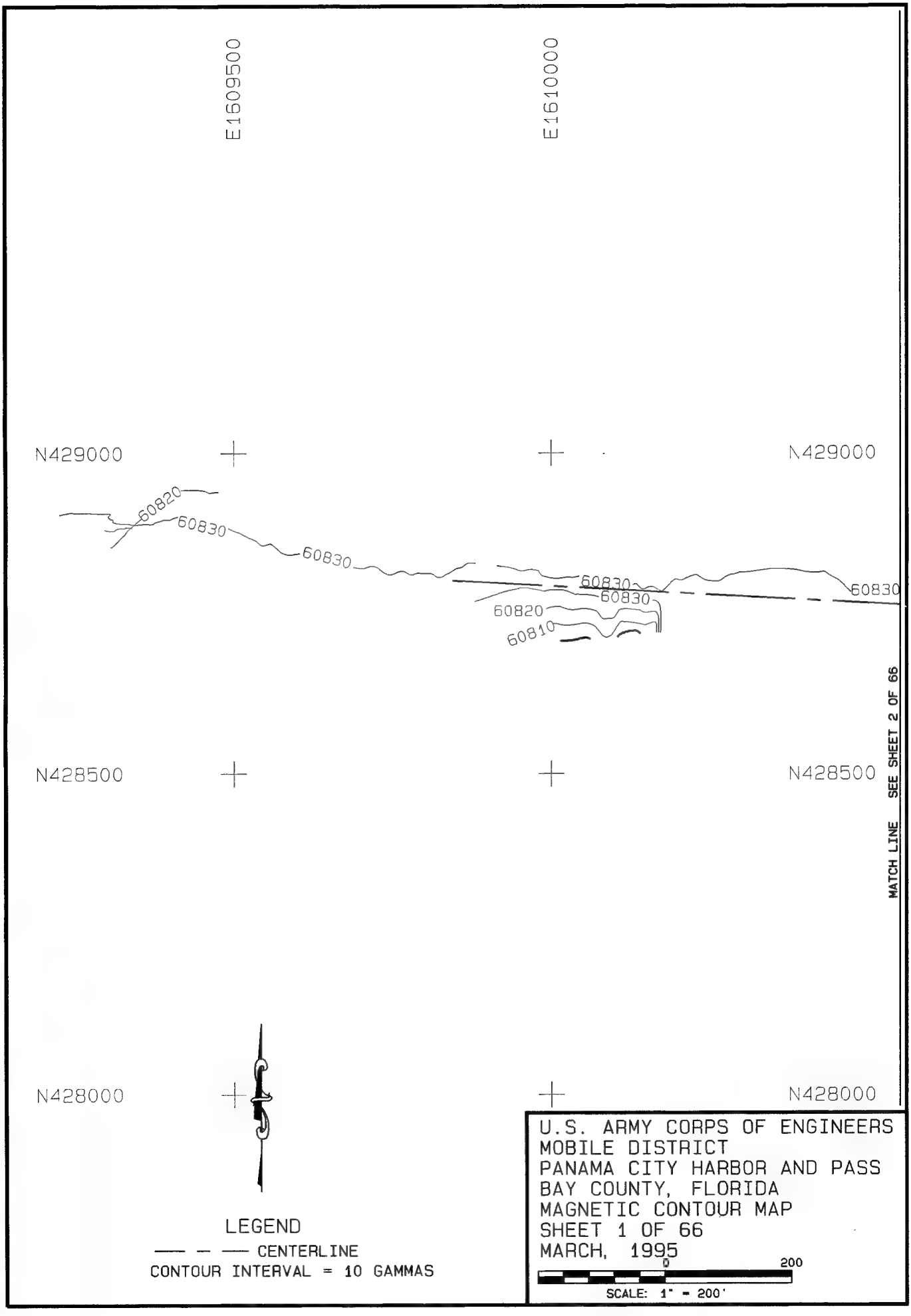
SURVEY AREA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N428500
MATCH LINE SEE SHEET 2 OF 66
N428000
N428000
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 1 OF 66
MARCH, 1995
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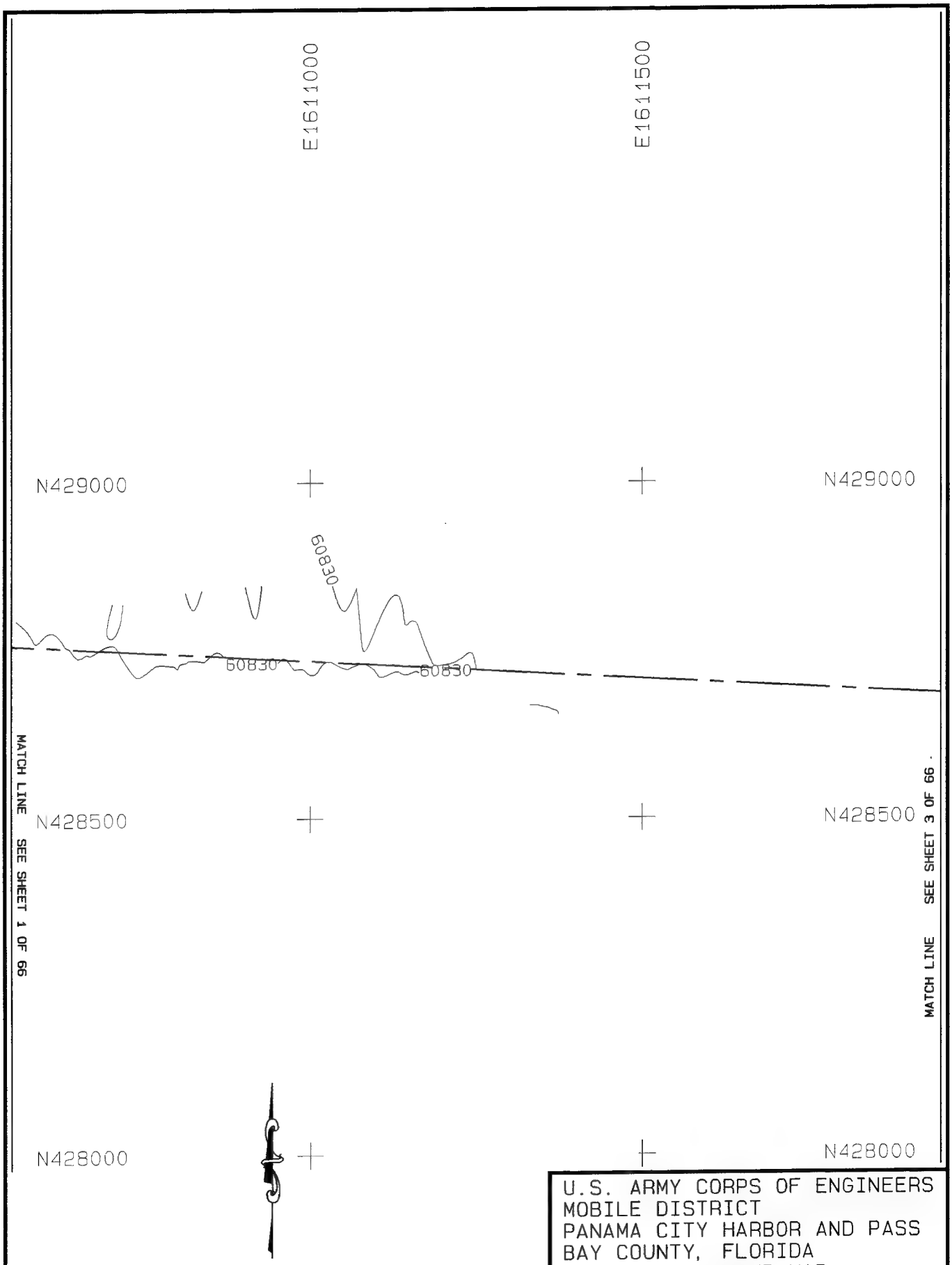

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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 2 OF 66
MARCH, 1995

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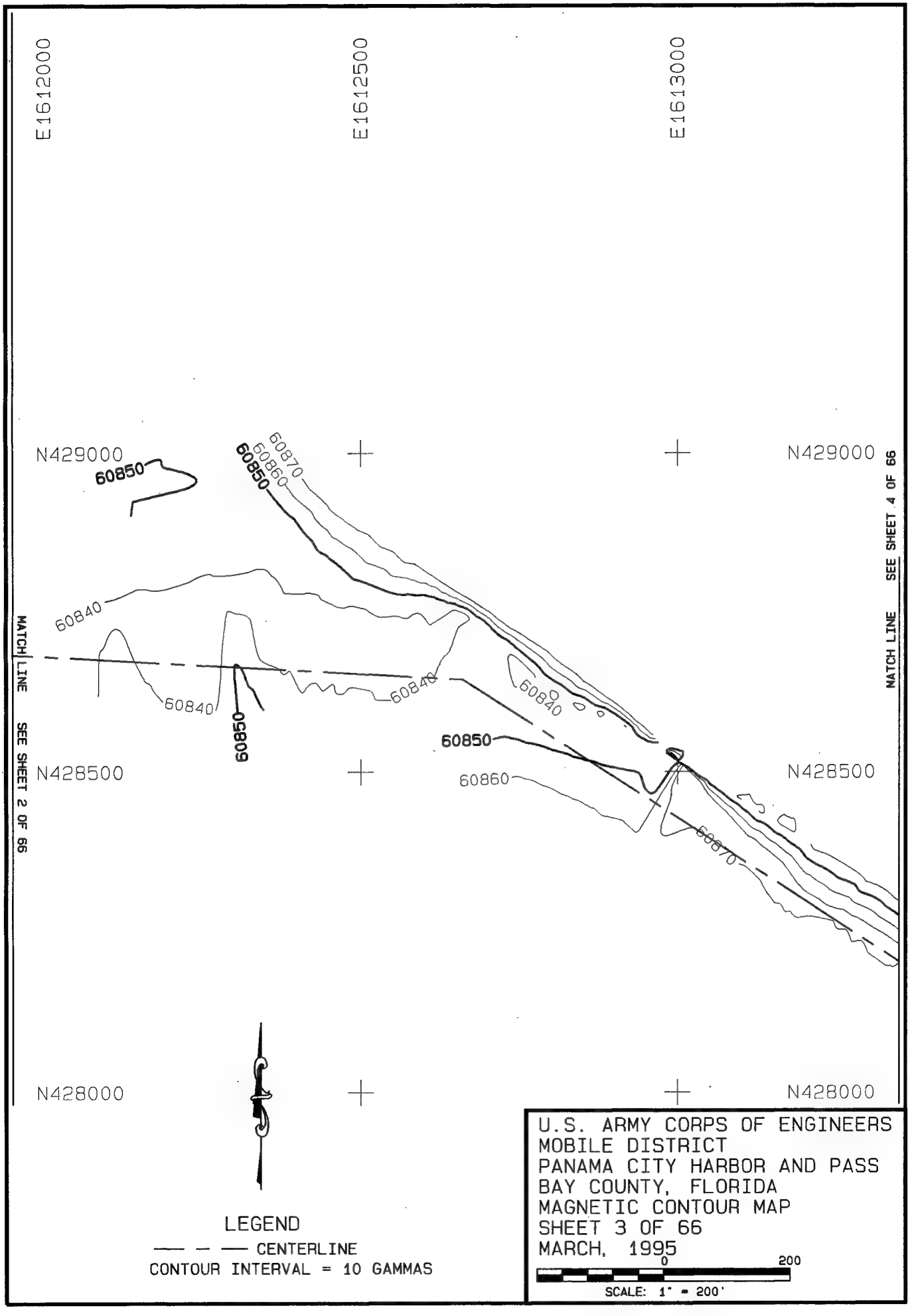
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MATCH LINE SEE SHEET 2 OF 66
MATCH LINE SEE SHEET 4 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 3 OF 66
MARCH, 1995
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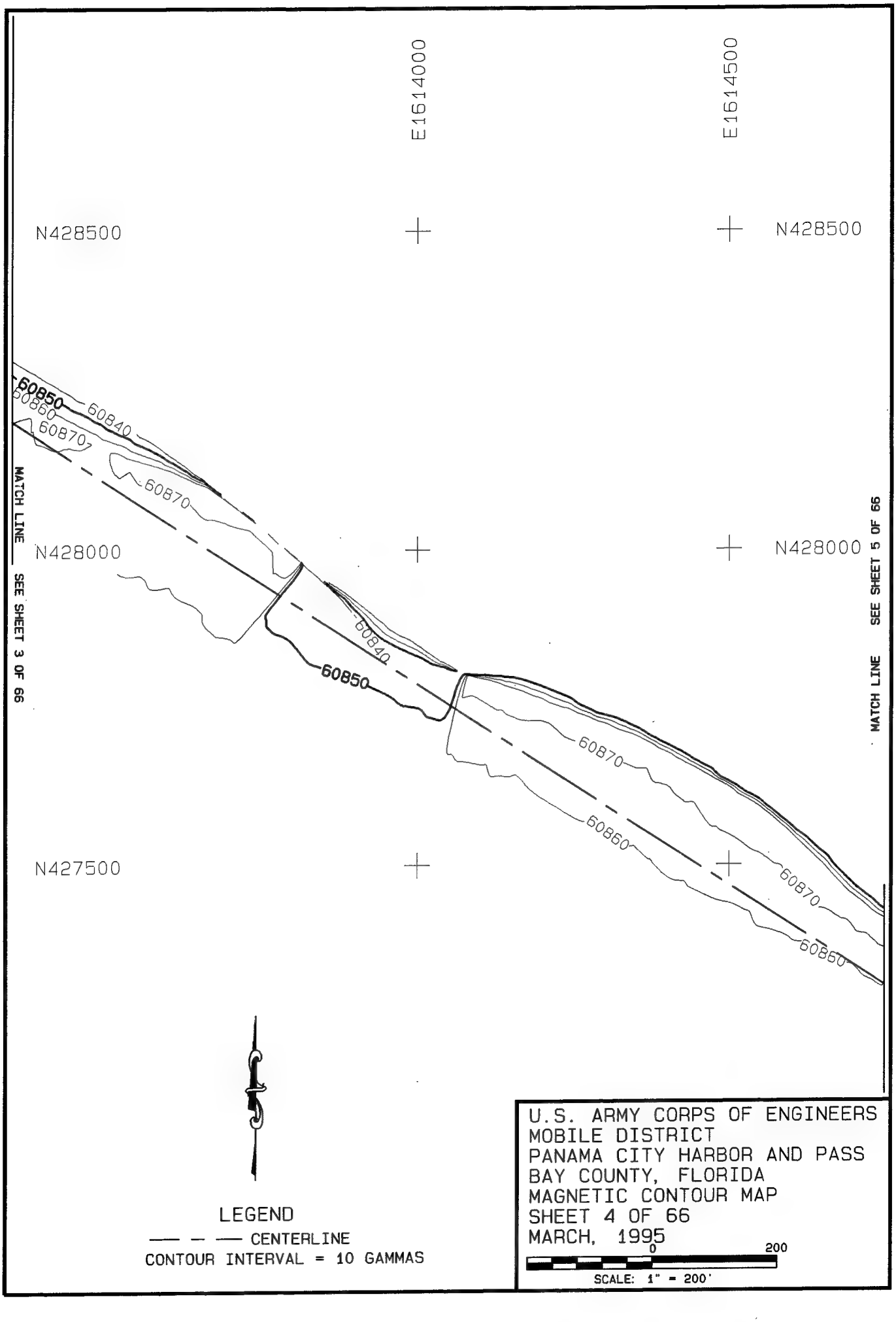
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60860
60870
60860
MATCH LINE
SEE SHEET 3 OF 66
MATCH LINE
SEE SHEET 5 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 4 OF 66
MARCH, 1995
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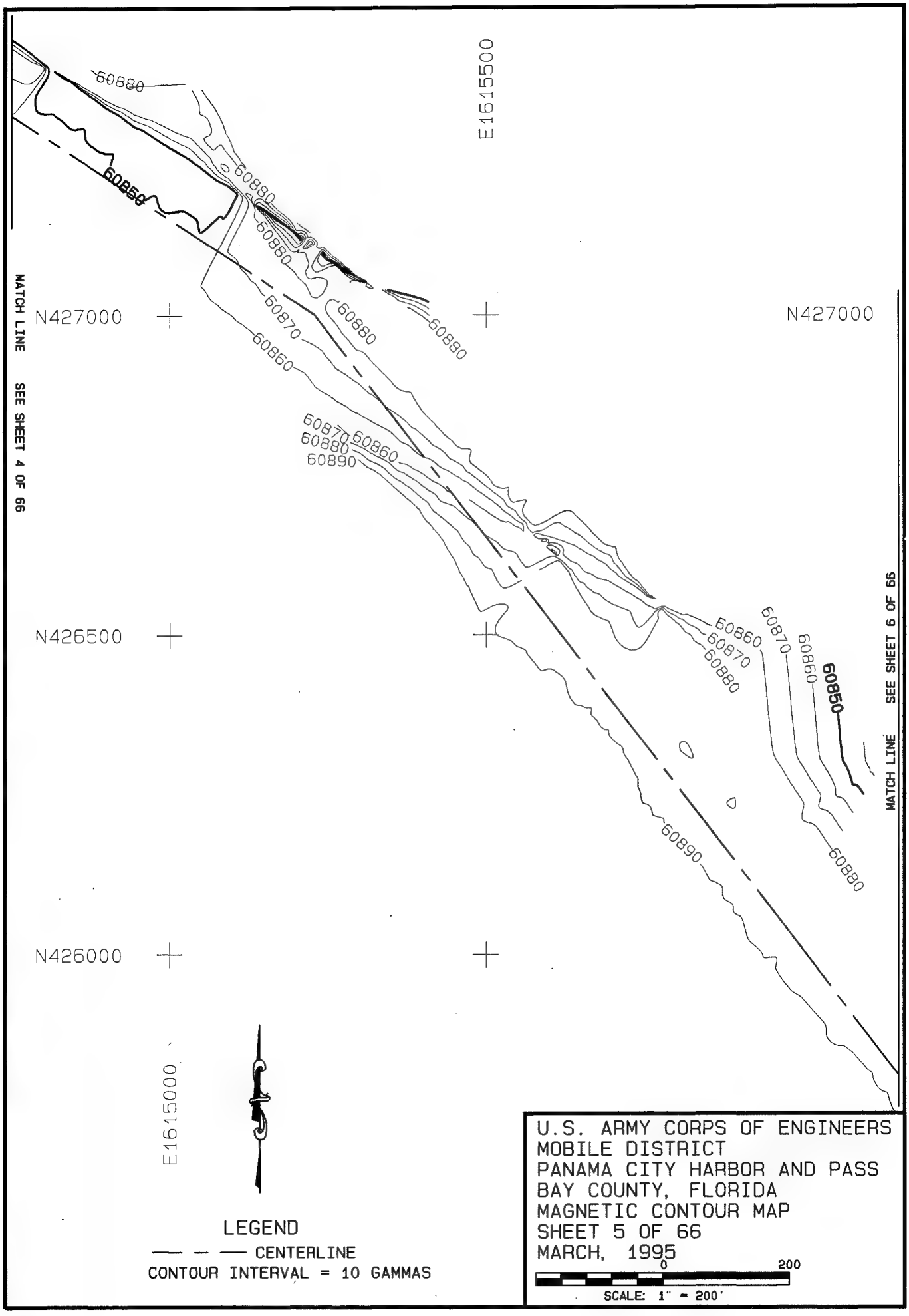
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MATCH LINE SEE SHEET 4 OF 66
MATCH LINE SEE SHEET 6 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 5 OF 66
MARCH, 1995
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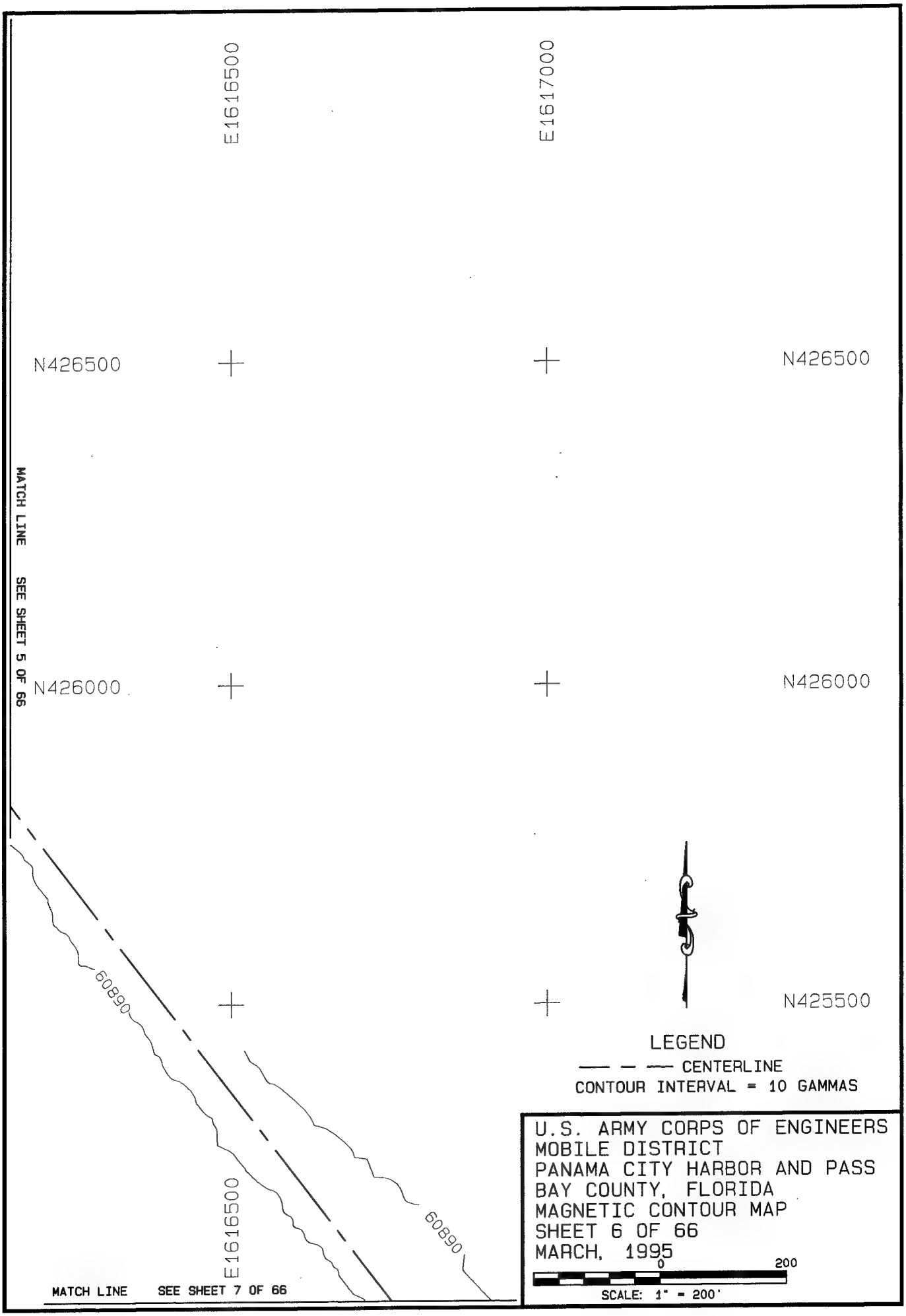
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MATCH LINE SEE SHEET 7 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 6 OF 66
MARCH, 1995
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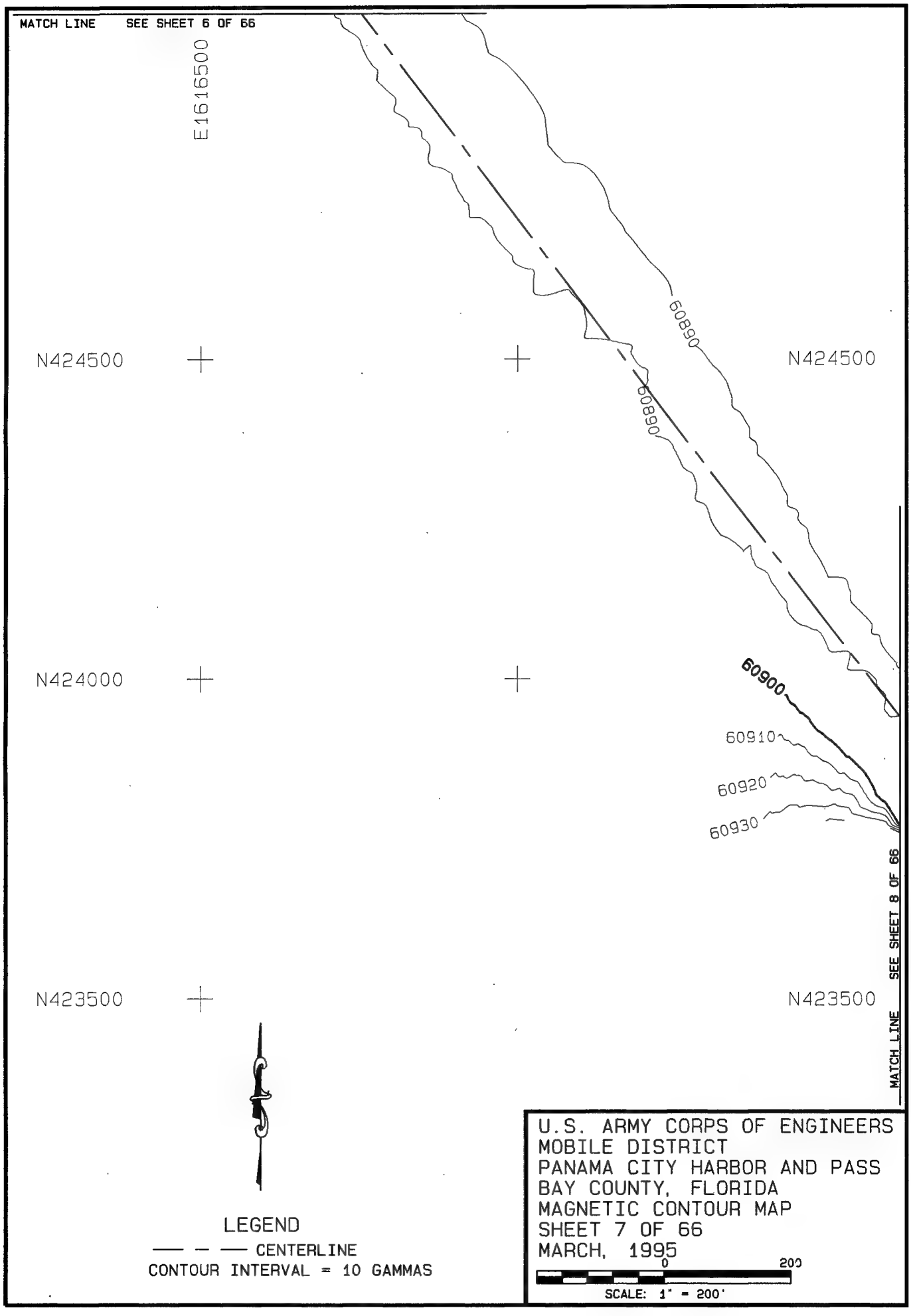
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MATCH LINE SEE SHEET 8 OF 66
LEGEND
CENTERLINE
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U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 7 OF 66
MARCH, 1995
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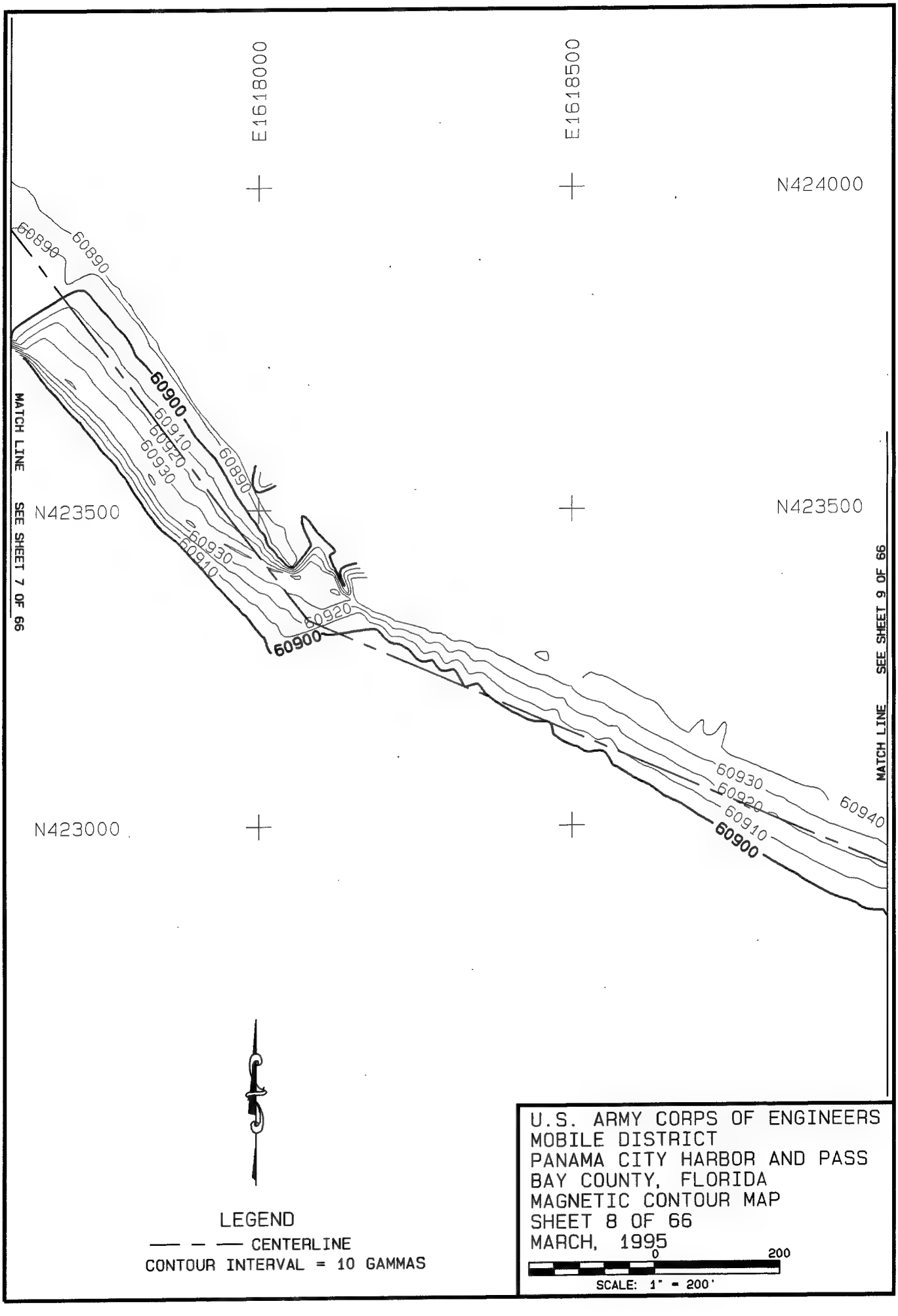

LEGEND

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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 8 OF 66
MARCH, 1995

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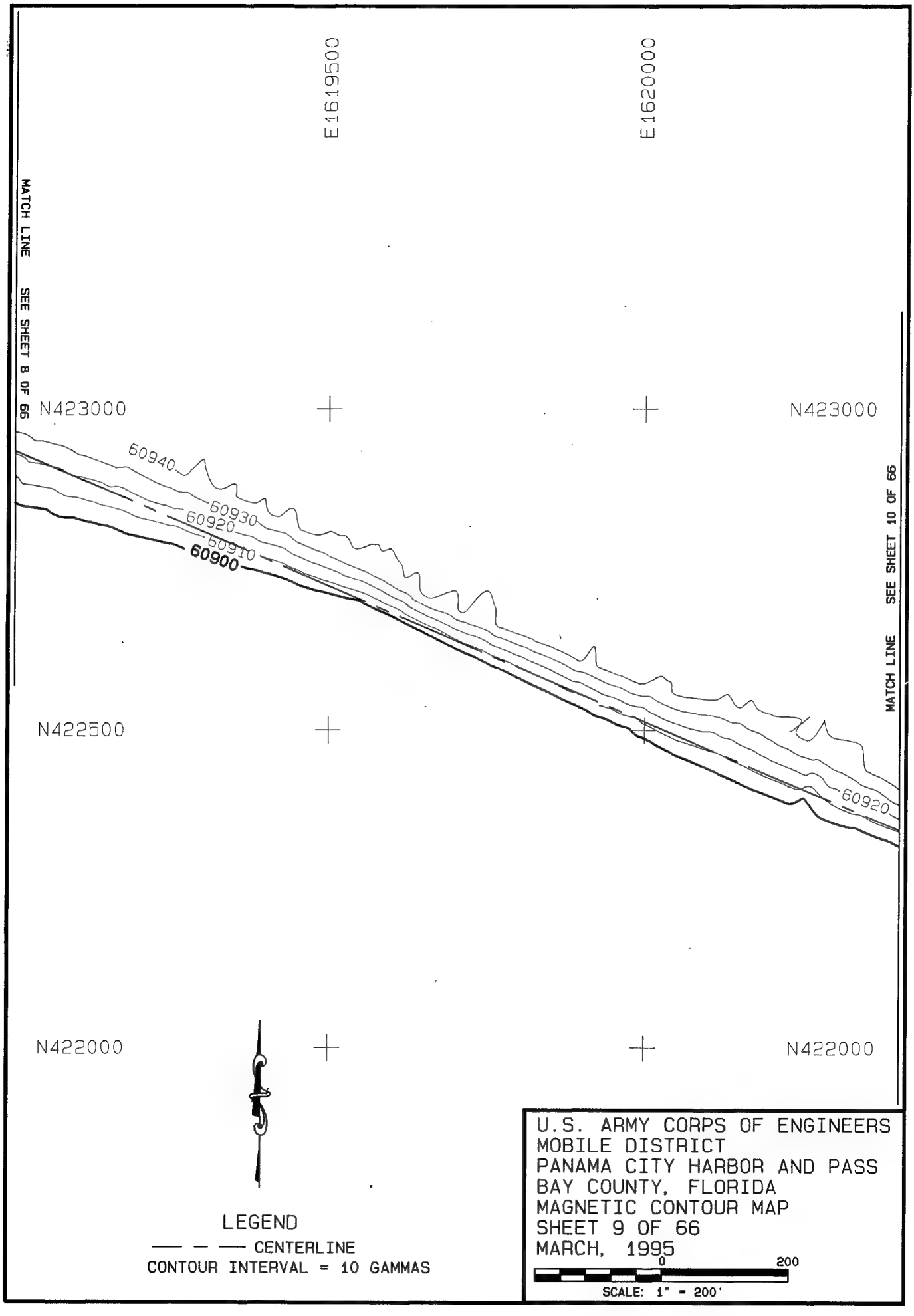
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MATCH LINE SEE SHEET 10 OF 66
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N422000
N422000
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 9 OF 66
MARCH, 1995
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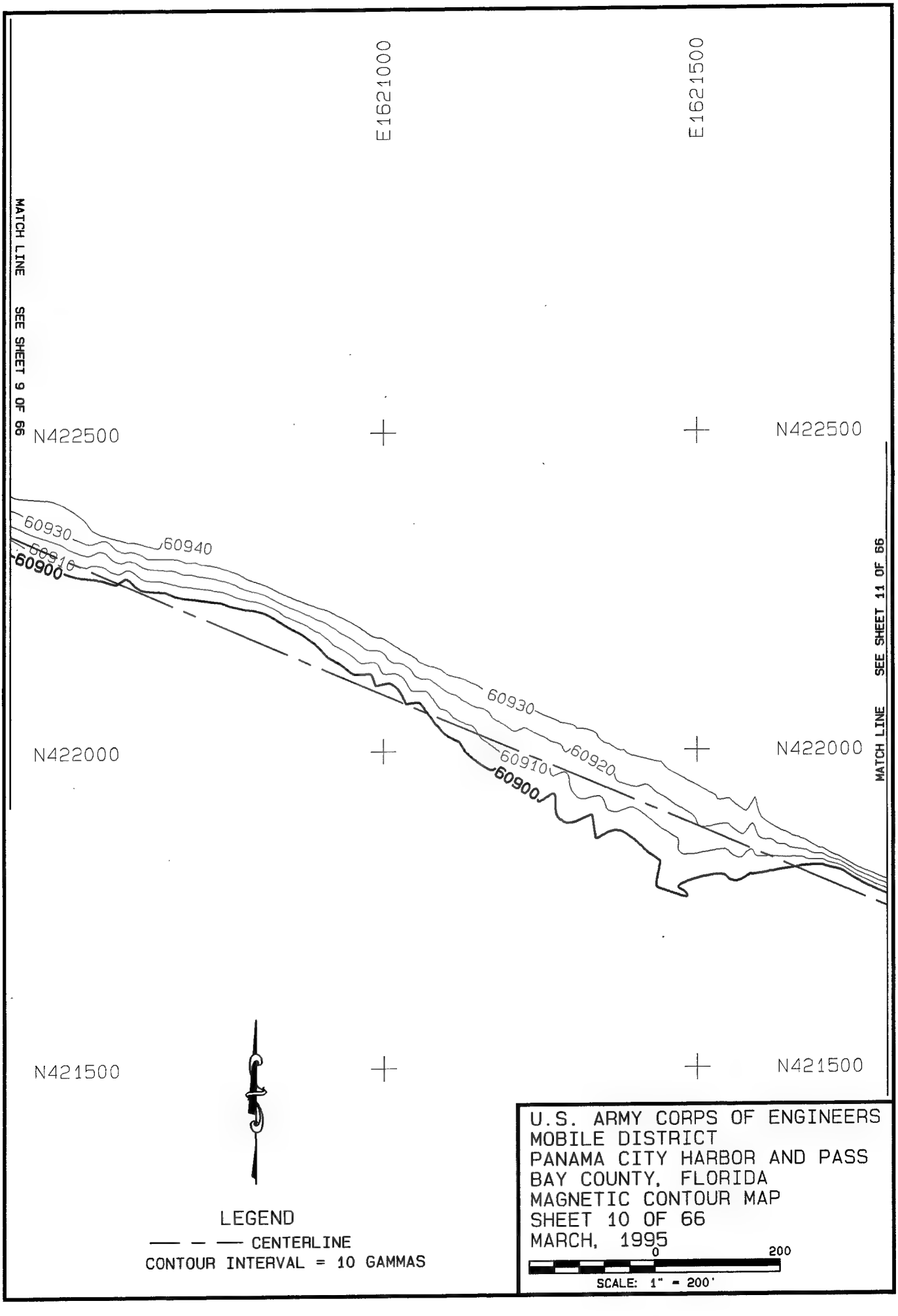
SCALE: 1" = 200'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MATCH LINE SEE SHEET 11 OF 66
N422000
N422000
N421500
N421500
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 10 OF 66
MARCH, 1995
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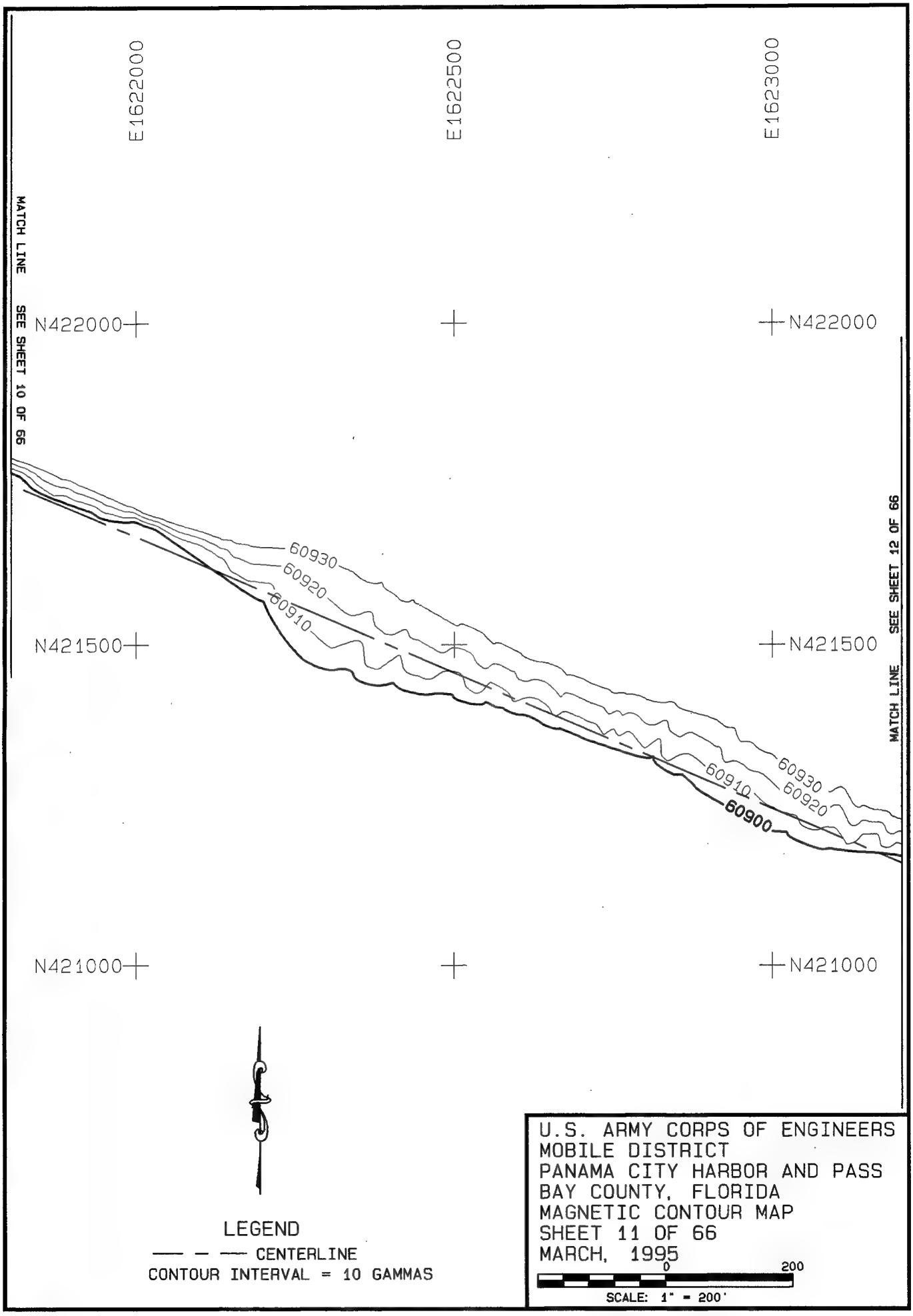
SCALE: 1" = 200'



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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 11 OF 66
MARCH, 1995

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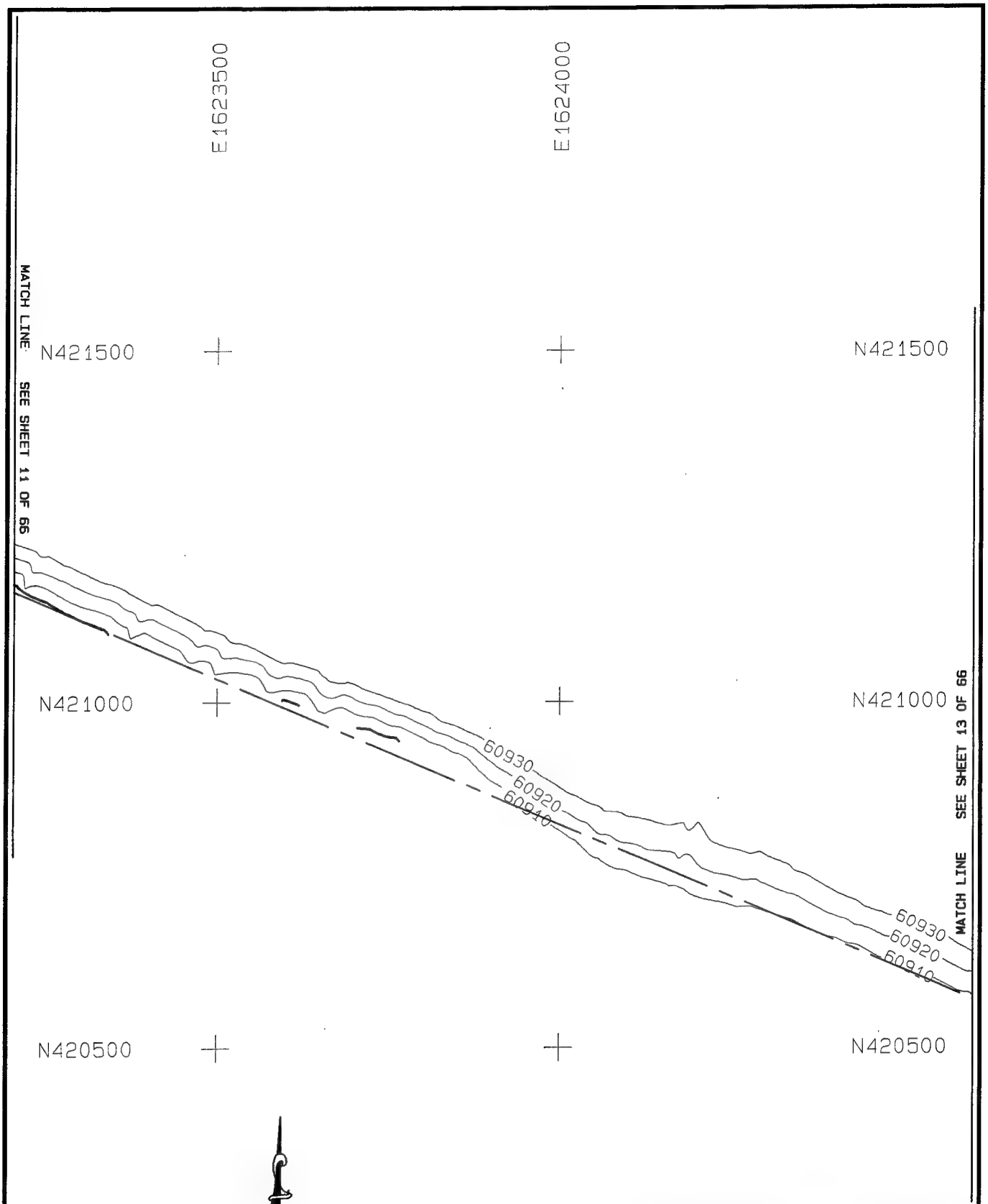

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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 12 OF 66
MARCH, 1995

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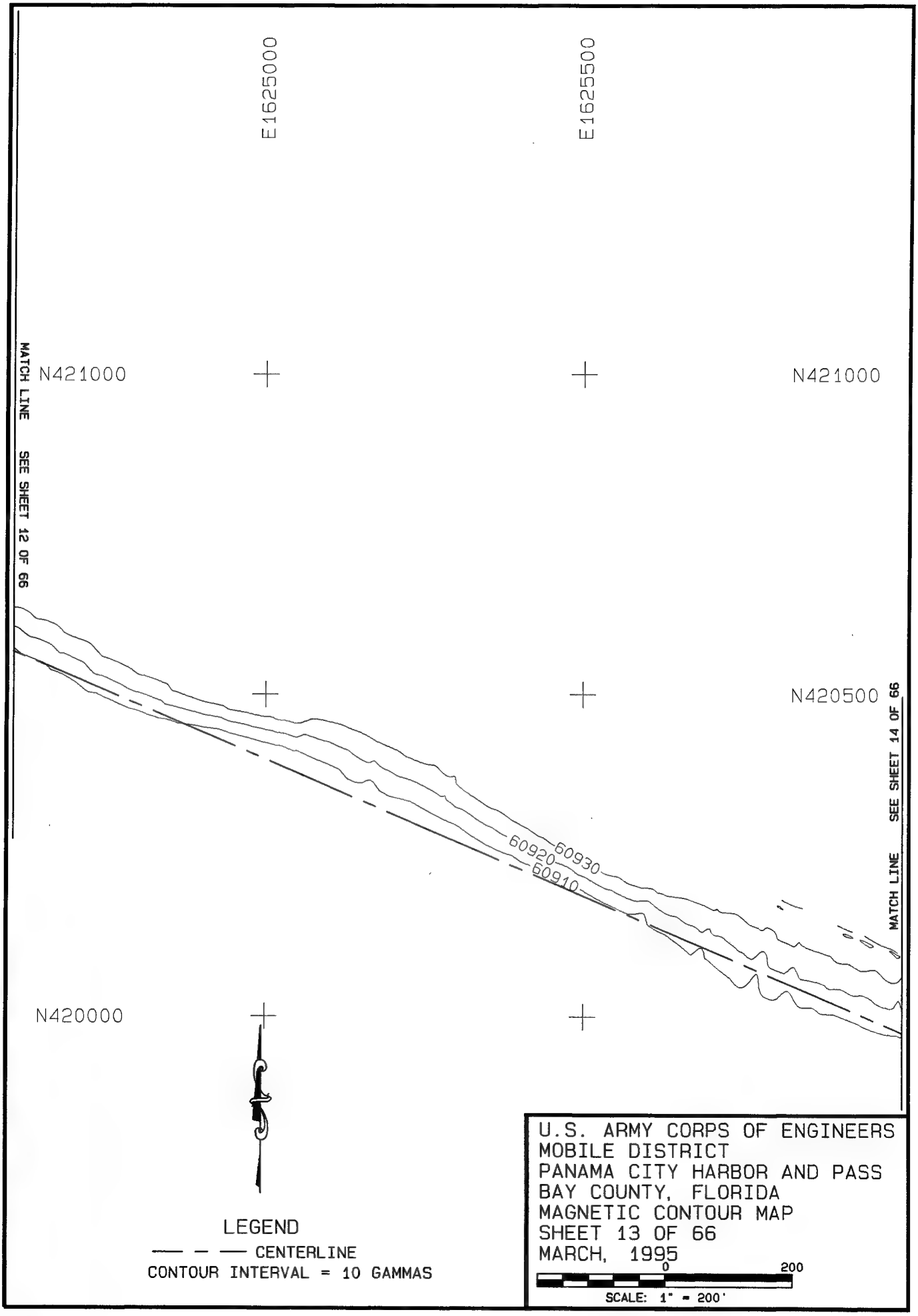
SCALE: 1" = 200'



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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 13 OF 66
MARCH, 1995

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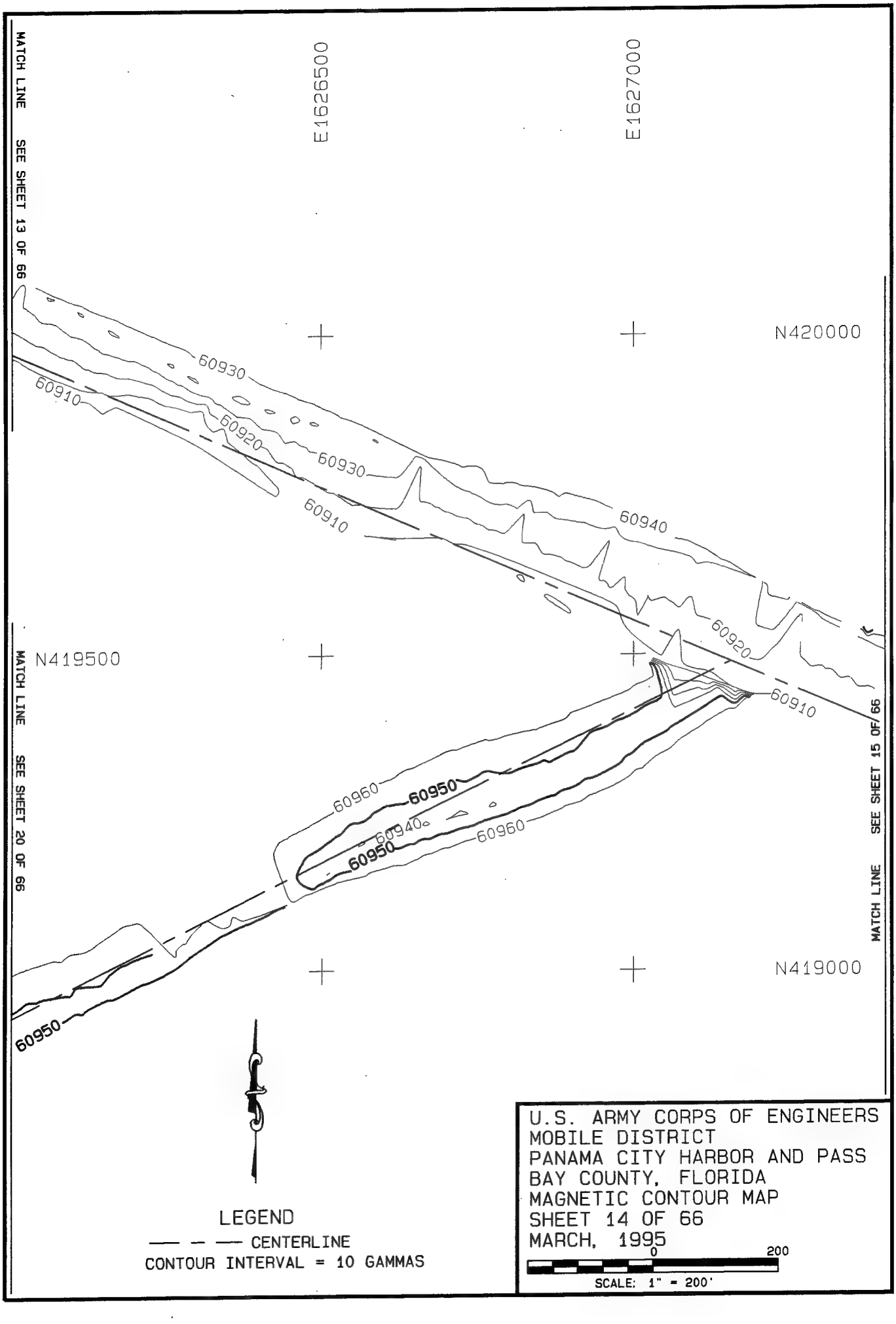
SCALE: 1" = 200'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MATCH LINE SEE SHEET 15 OF 66
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60940
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MATCH LINE SEE SHEET 20 OF 66
60950
N419000
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 14 OF 66
MARCH, 1995
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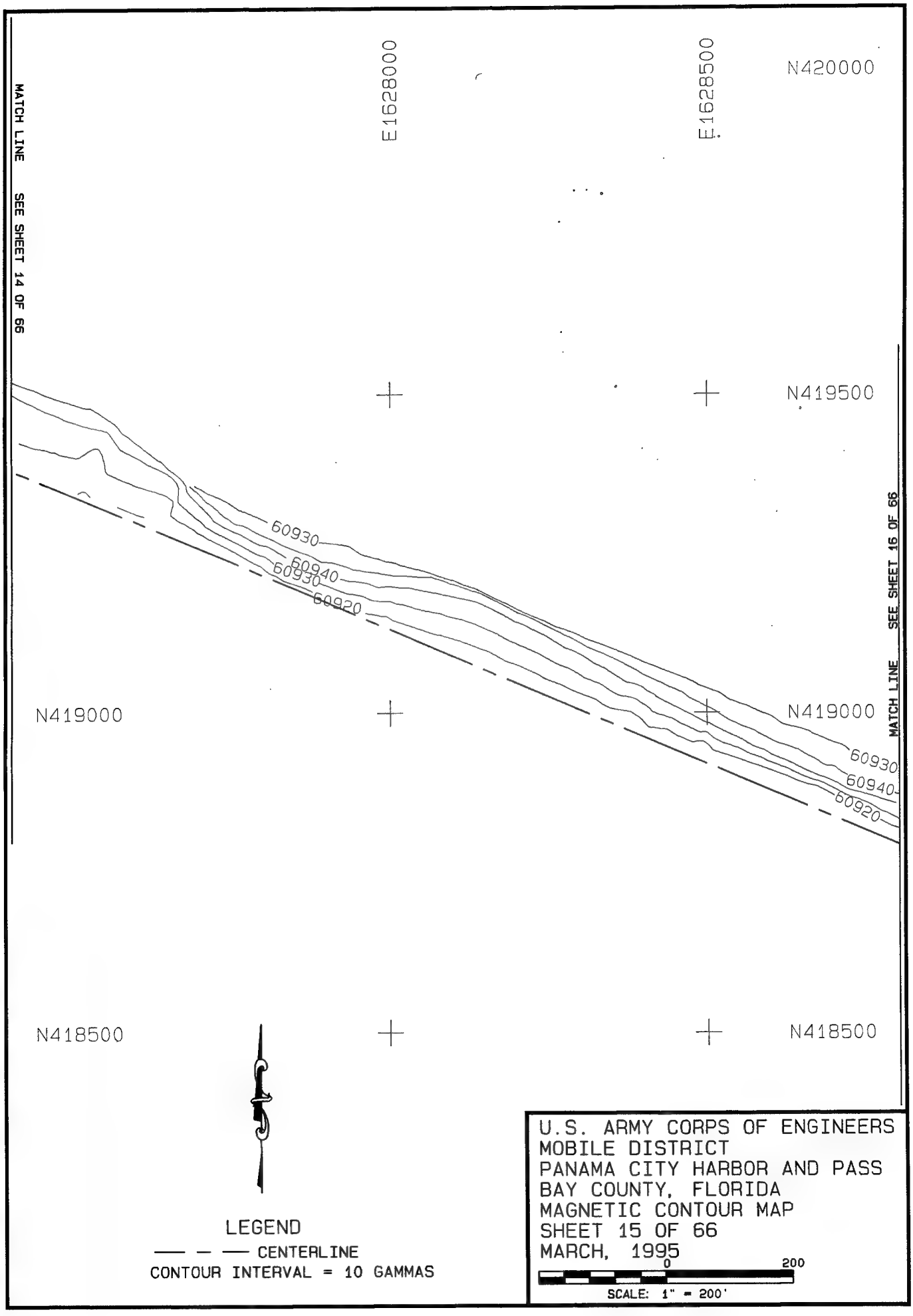
SCALE: 1" = 200'



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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 15 OF 66
MARCH, 1995

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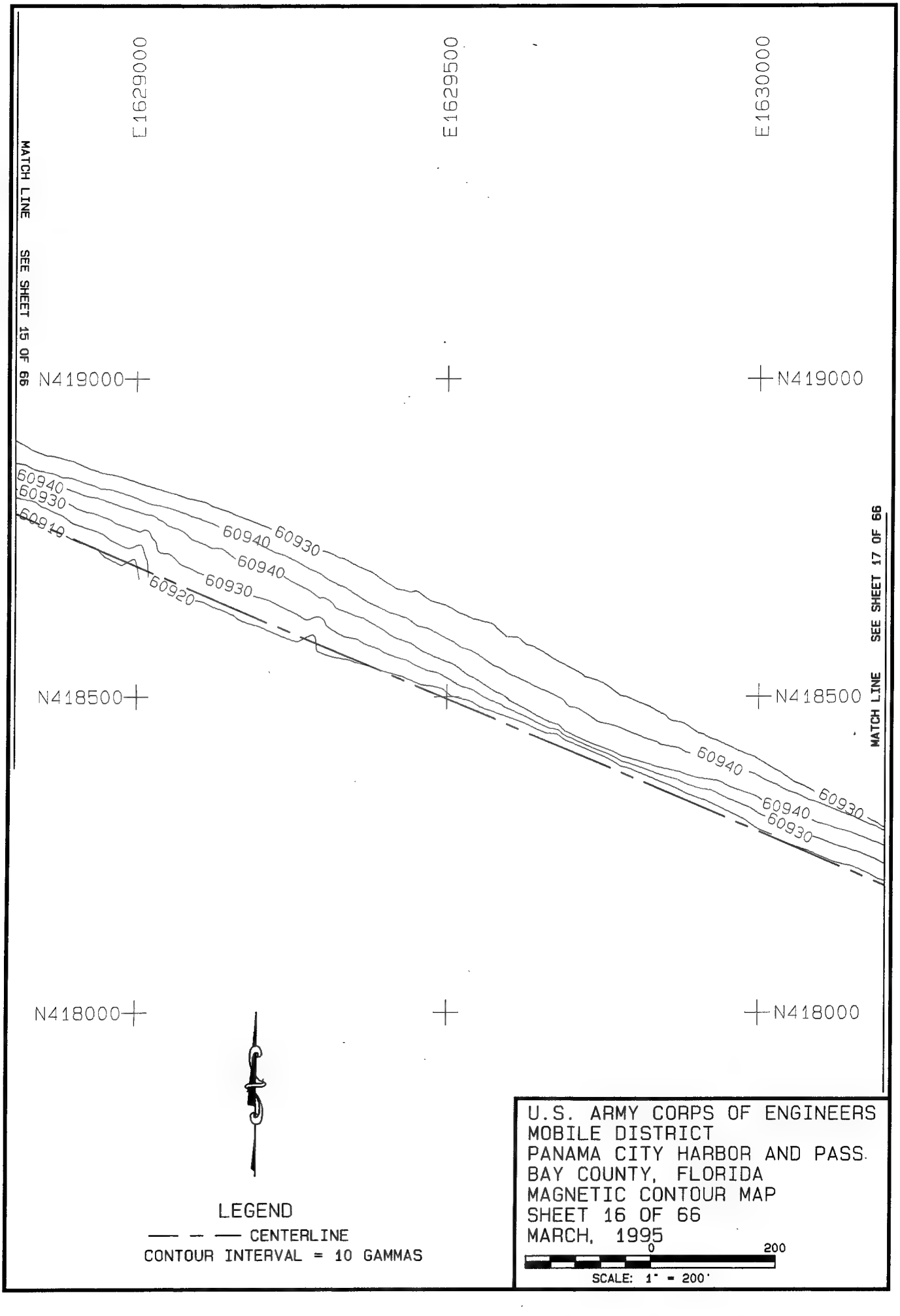
SCALE: 1" = 200'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N418500
N418500
MATCH LINE SEE SHEET 17 OF 66
N418000
N418000
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS.
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 16 OF 66
MARCH, 1995
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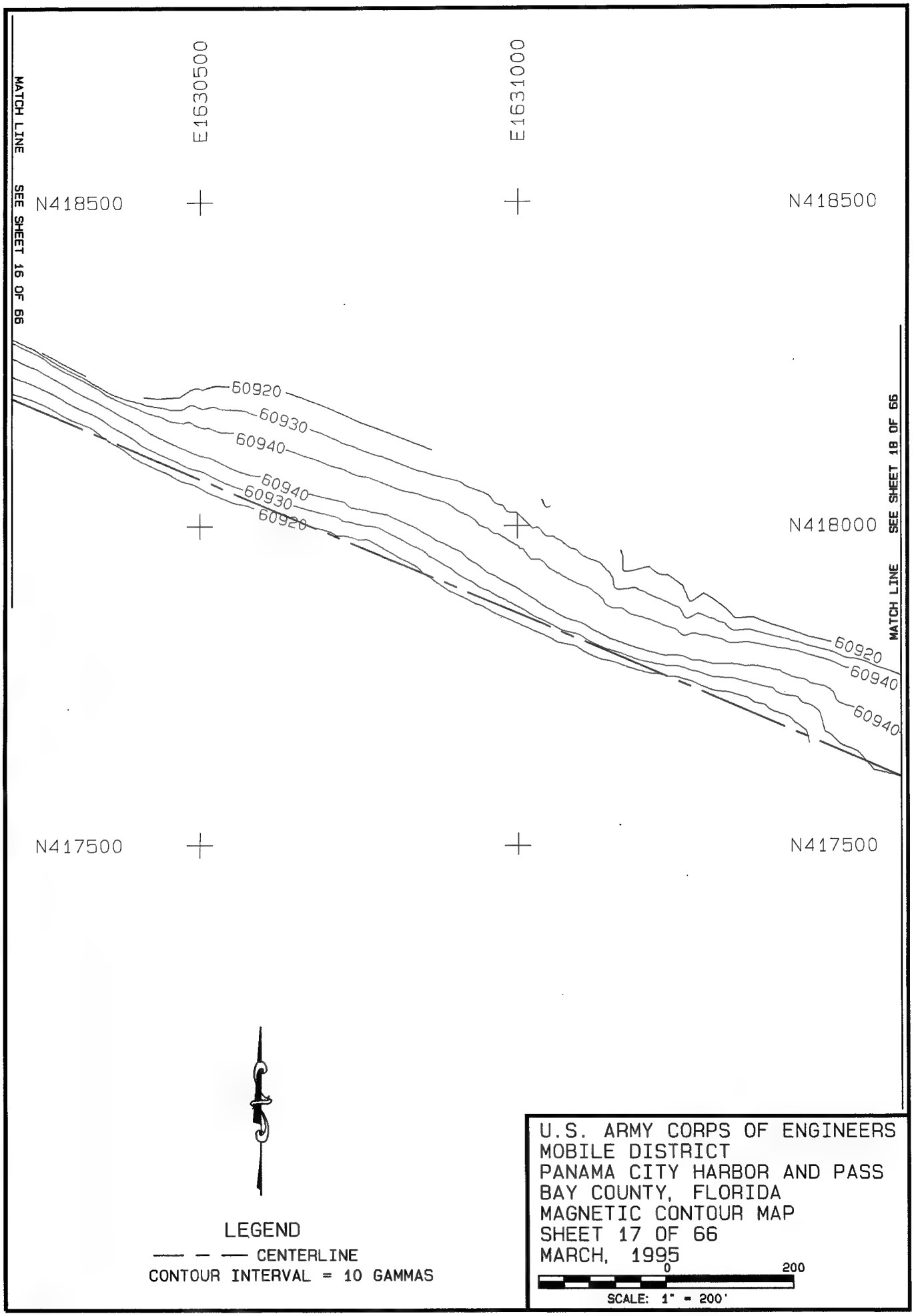

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CONTOUR INTERVAL = 10 GAMMAS

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MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 17 OF 66
MARCH, 1995

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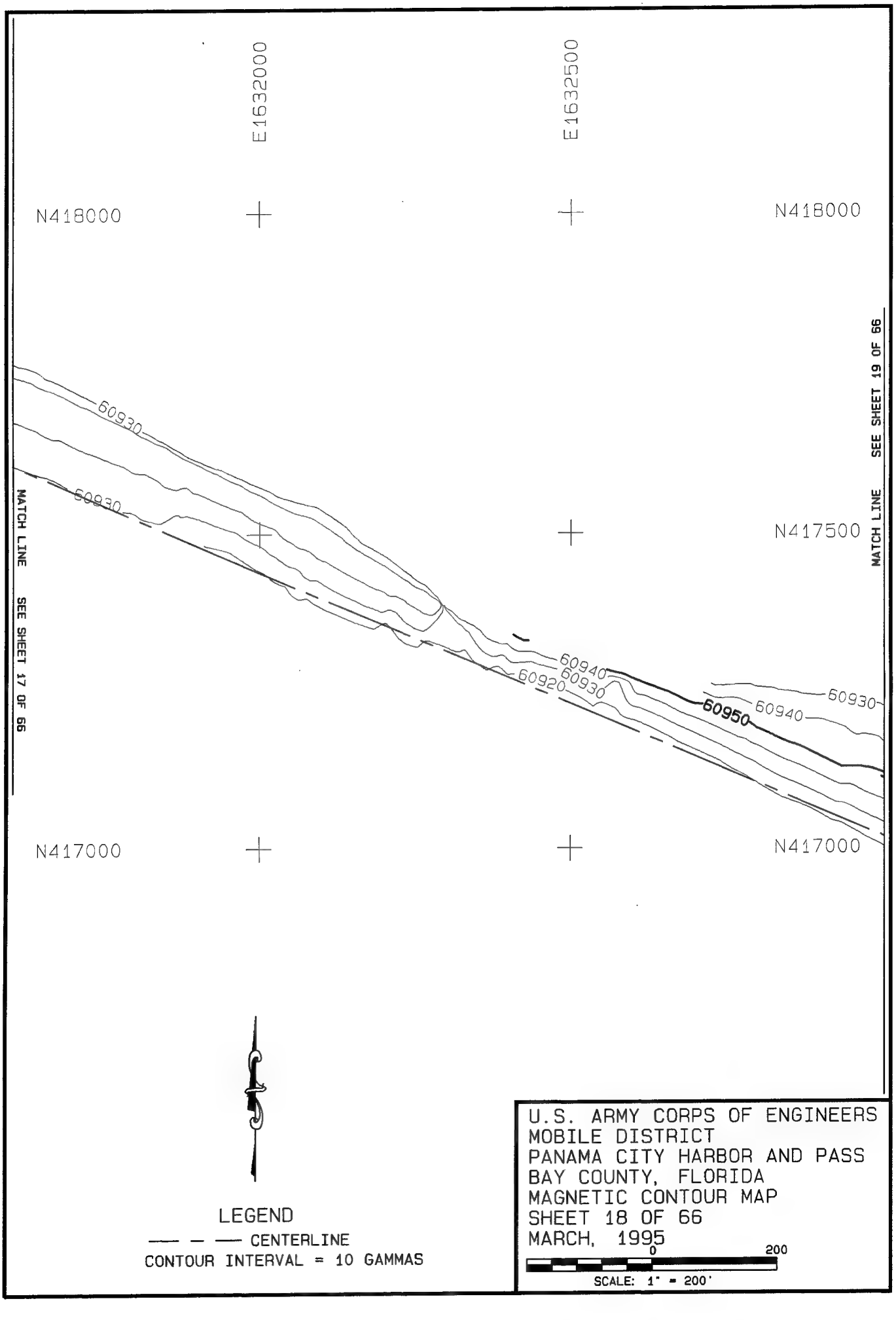
SCALE: 1" = 200'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60930
MATCH LINE SEE SHEET 17 OF 66
MATCH LINE SEE SHEET 19 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 18 OF 66
MARCH, 1995
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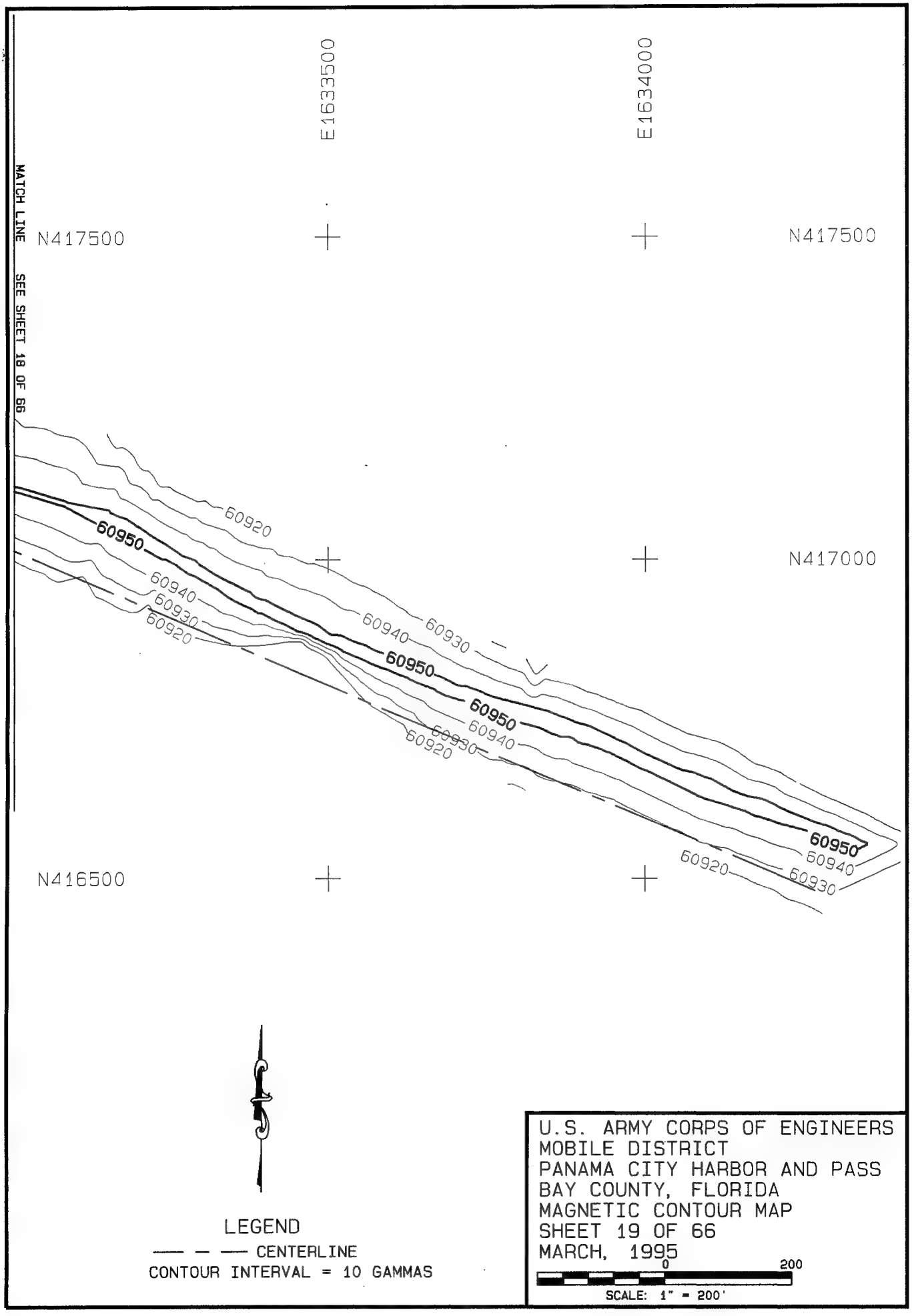

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CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 19 OF 66
MARCH, 1995

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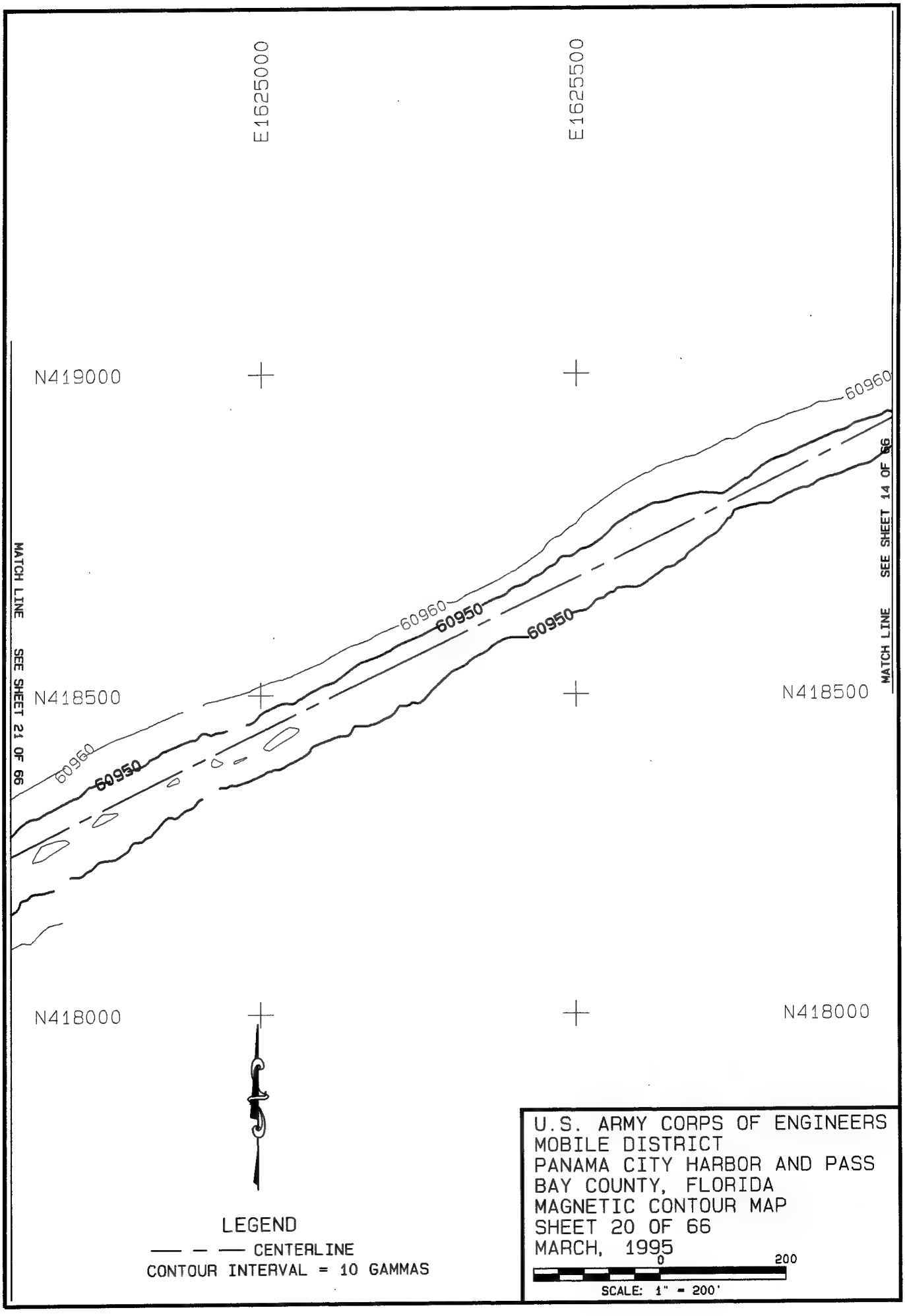
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MATCH LINE SEE SHEET 14 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 20 OF 66
MARCH, 1995
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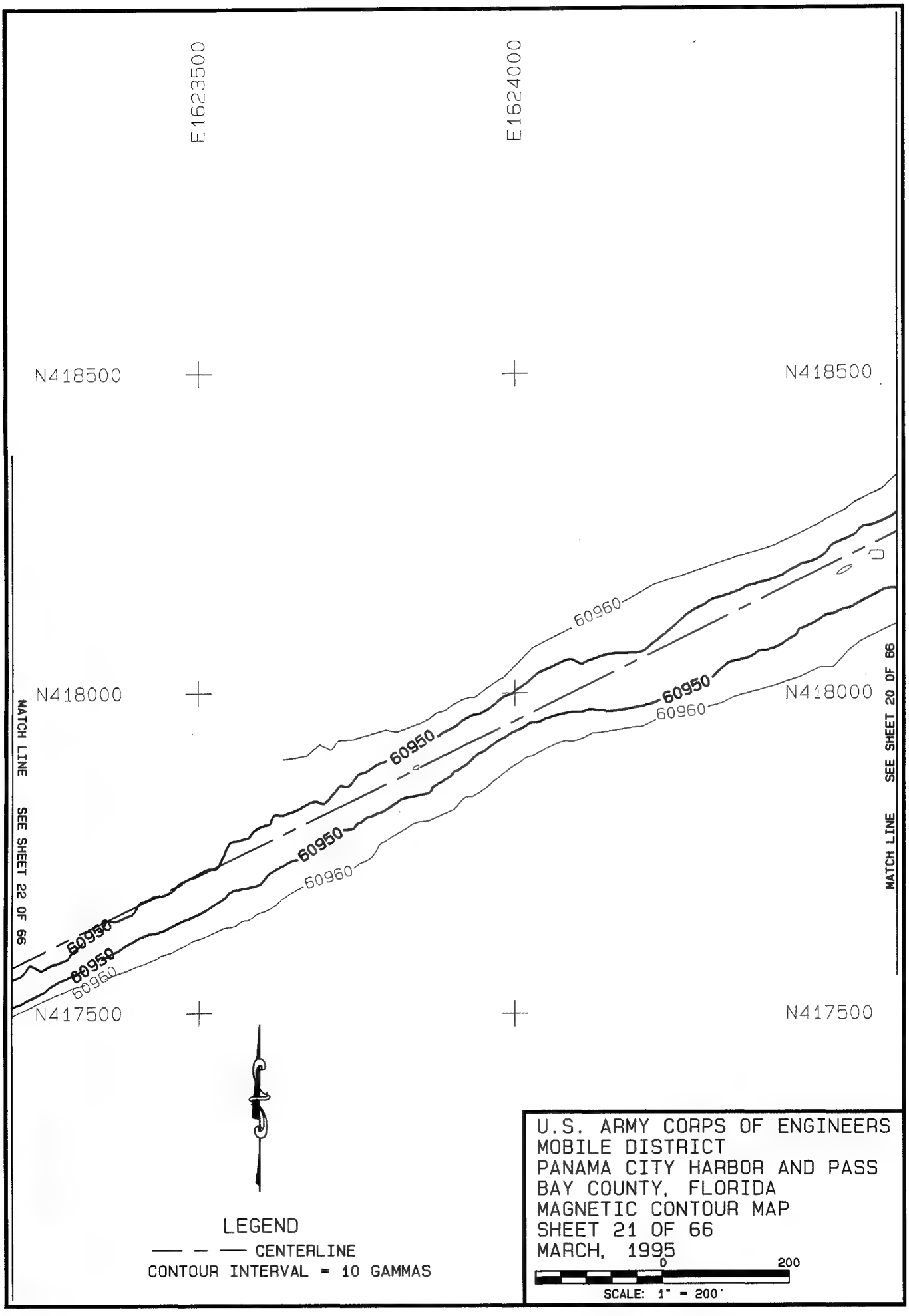
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MATCH LINE SEE SHEET 22 OF 66
MATCH LINE SEE SHEET 20 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 21 OF 66
MARCH, 1995
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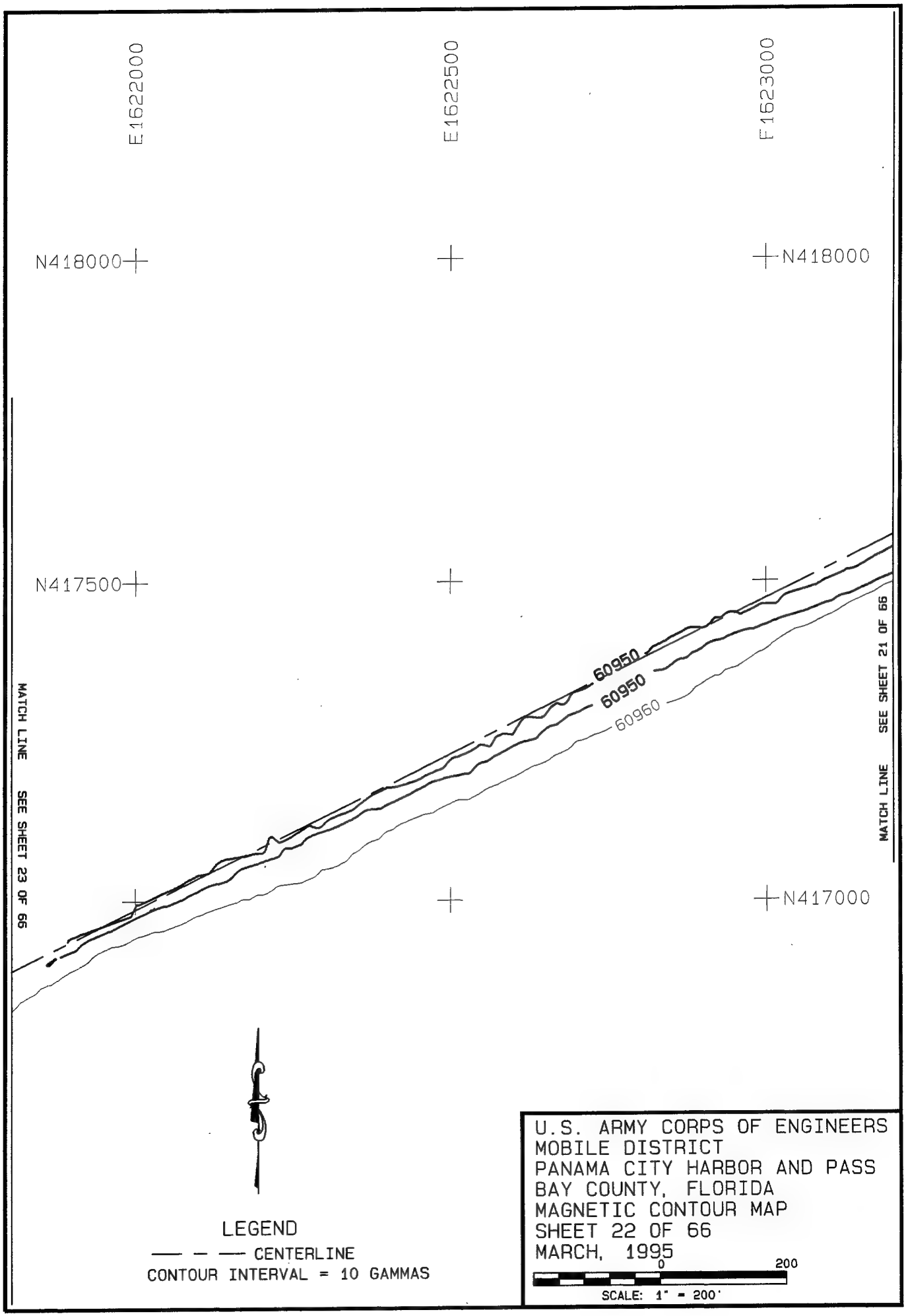
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MATCH LINE SEE SHEET 23 OF 66
MATCH LINE SEE SHEET 21 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 22 OF 66
MARCH, 1995
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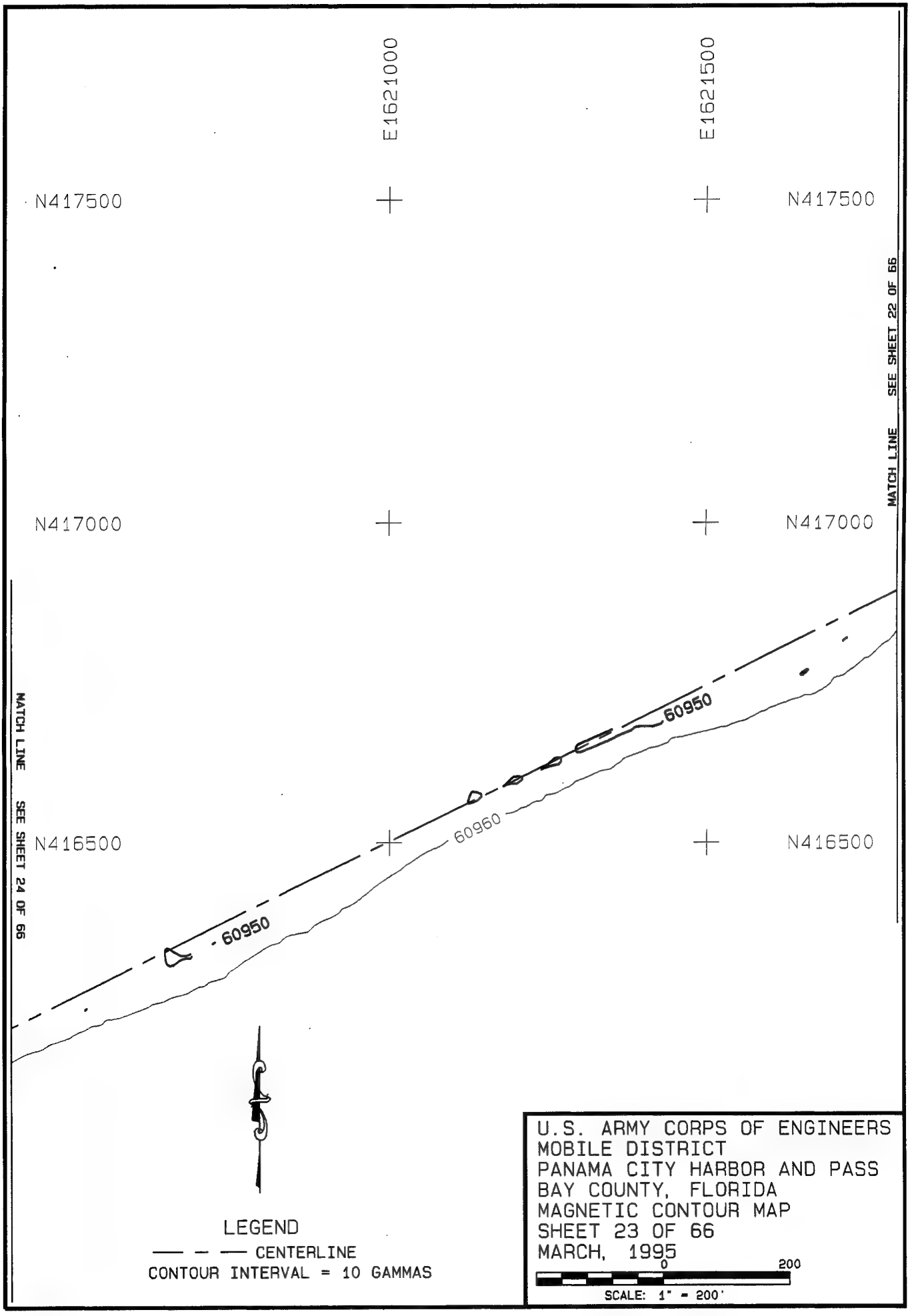
SCALE: 1" = 200'



LEGEND

— – — CENTERLINE

CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 23 OF 66
MARCH, 1995

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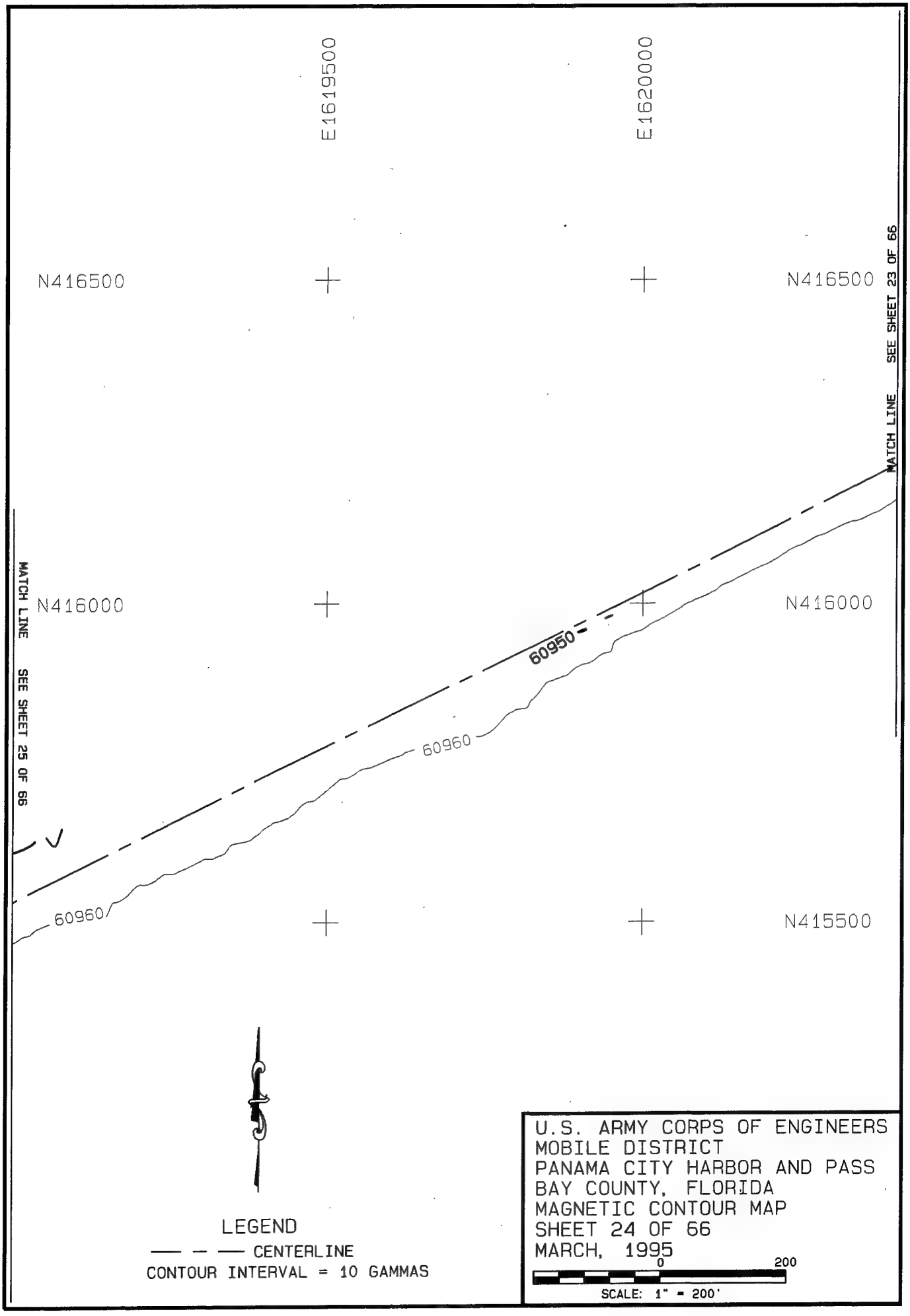
SCALE: 1" = 200'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MATCH LINE SEE SHEET 25 OF 66
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LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 24 OF 66
MARCH, 1995
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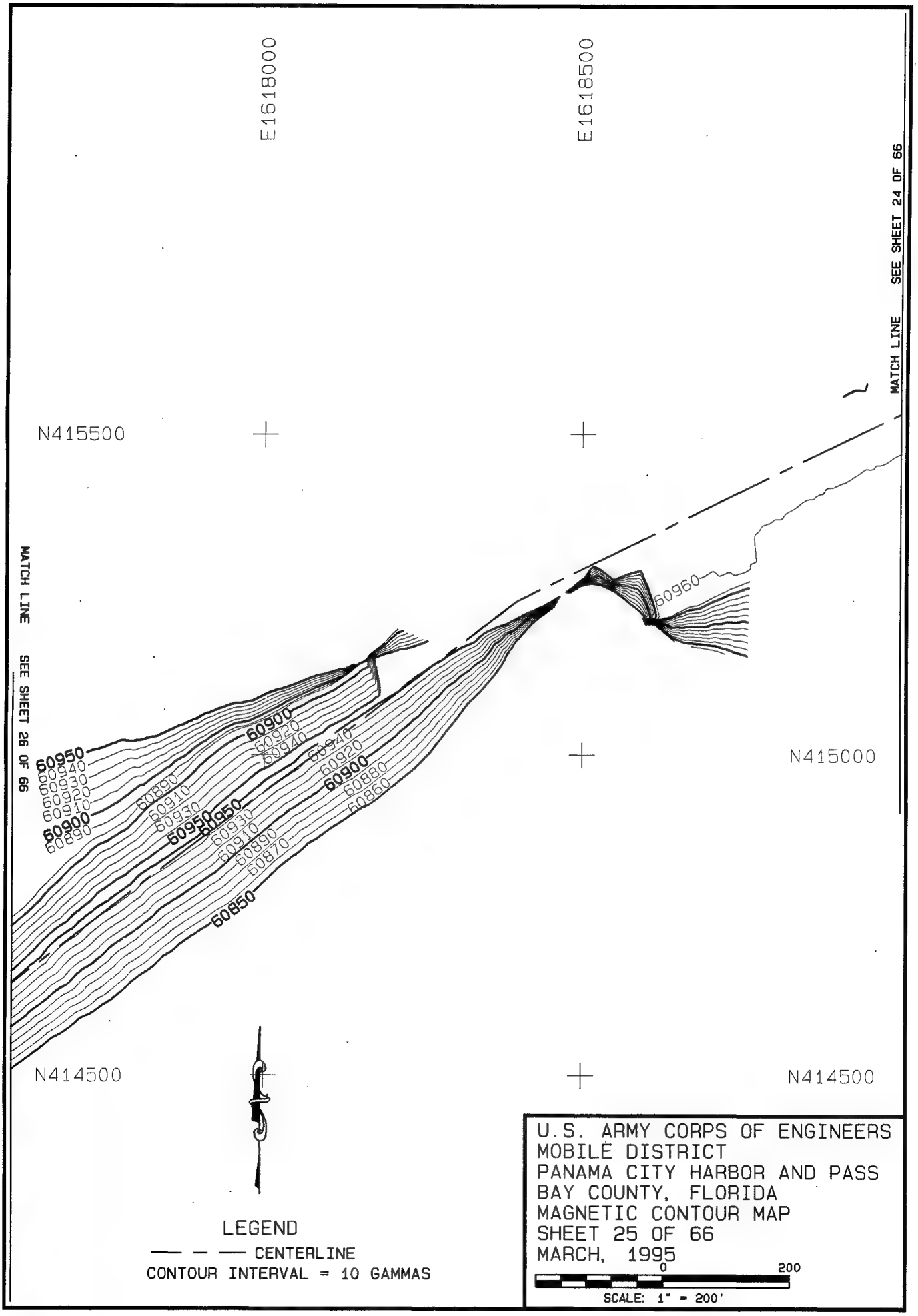
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MATCH LINE SEE SHEET 26 OF 66
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CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 25 OF 66
MARCH, 1995
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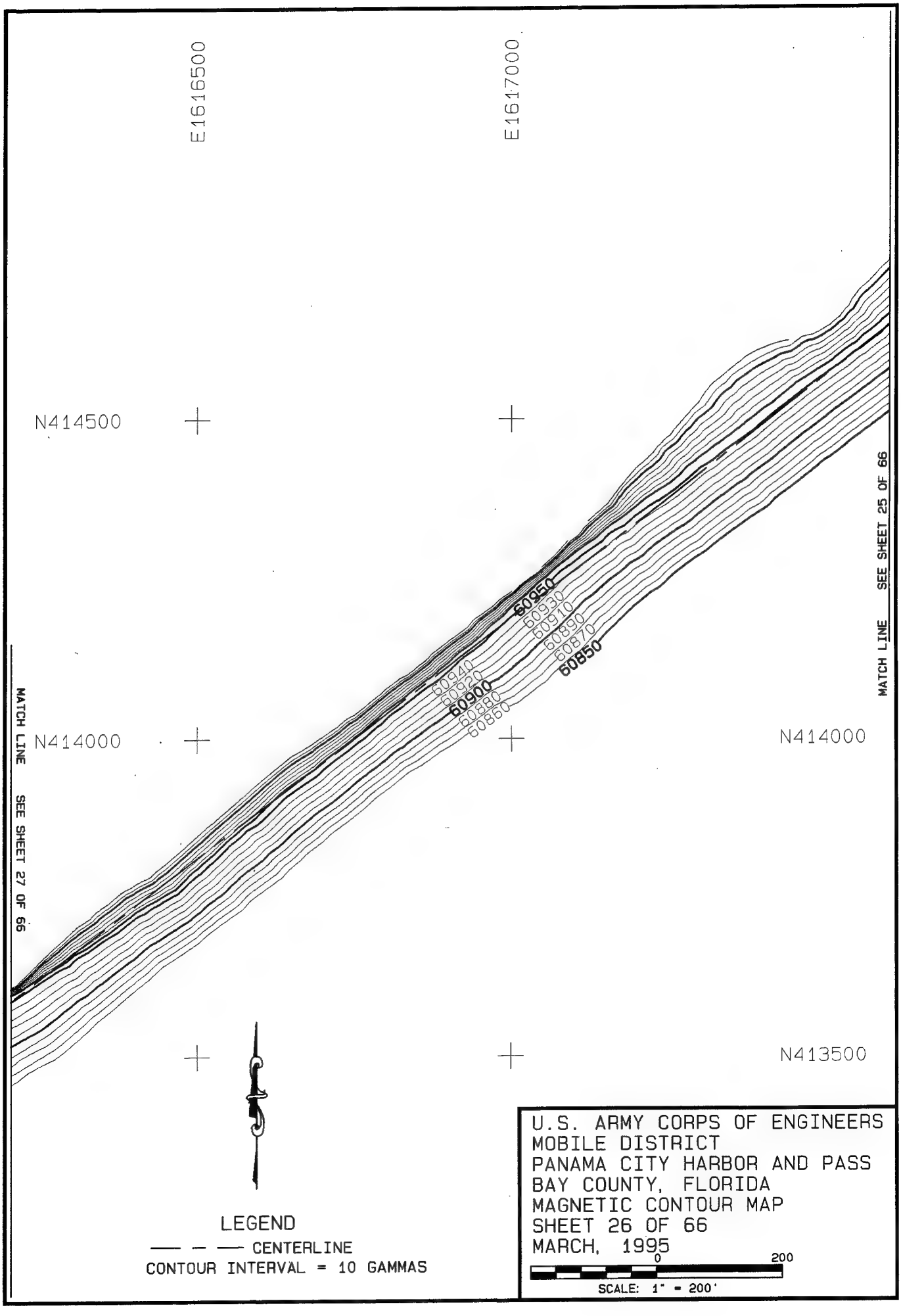
SCALE: 1" = 200'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MATCH LINE SEE SHEET 25 OF 66
MATCH LINE SEE SHEET 27 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 26 OF 66
MARCH, 1995
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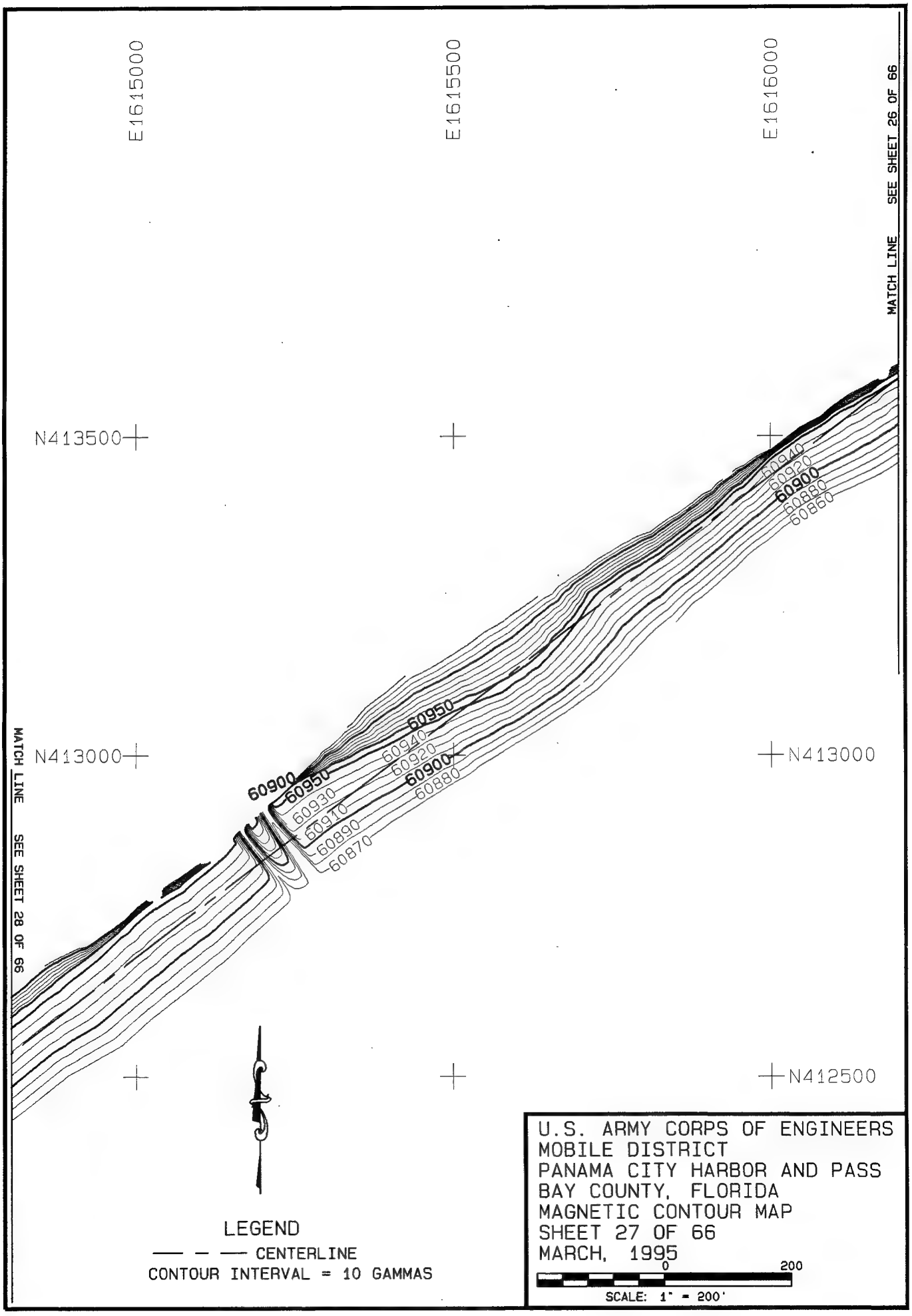
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N413000
N412500
MATCH LINE SEE SHEET 28 OF 66
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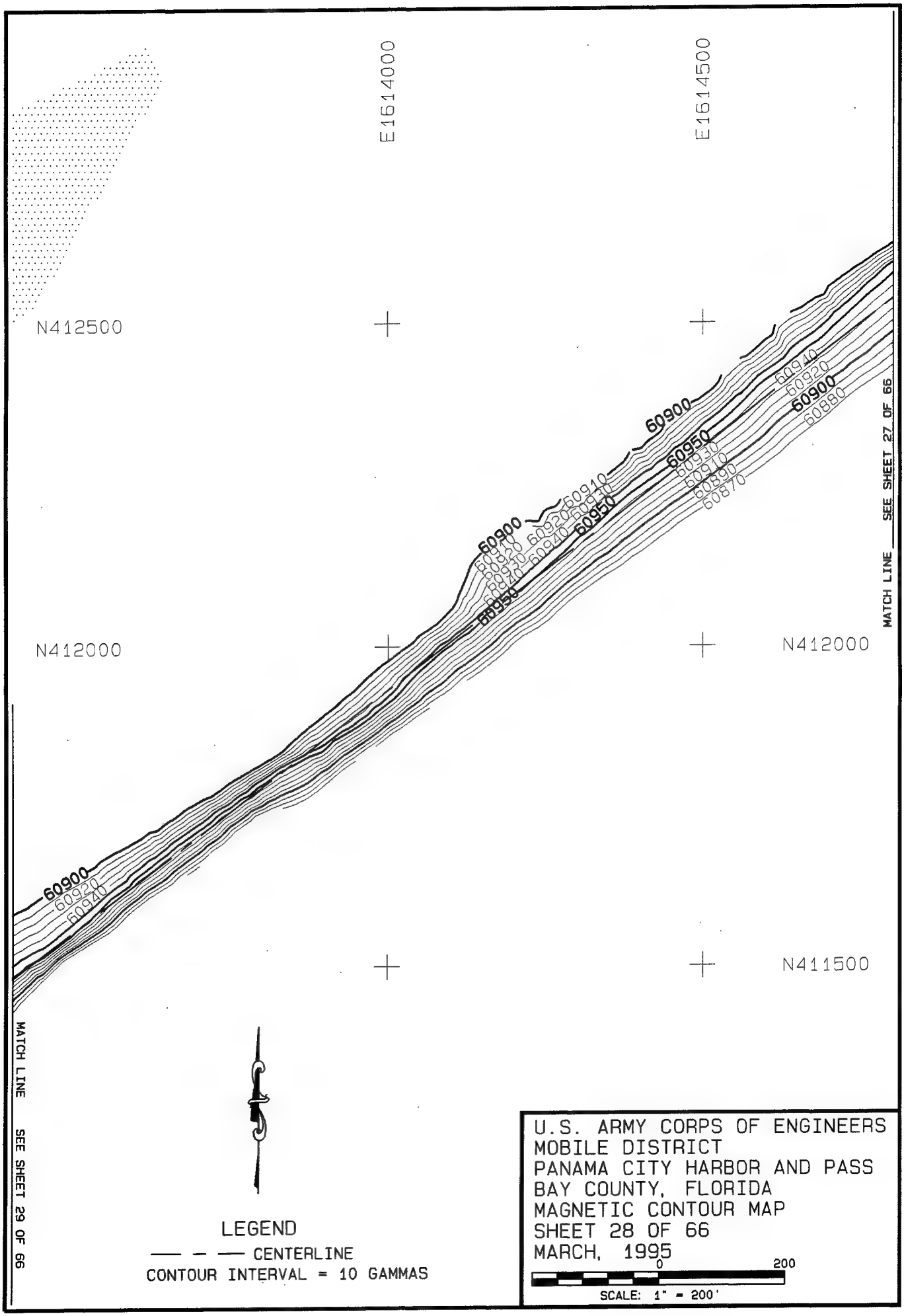
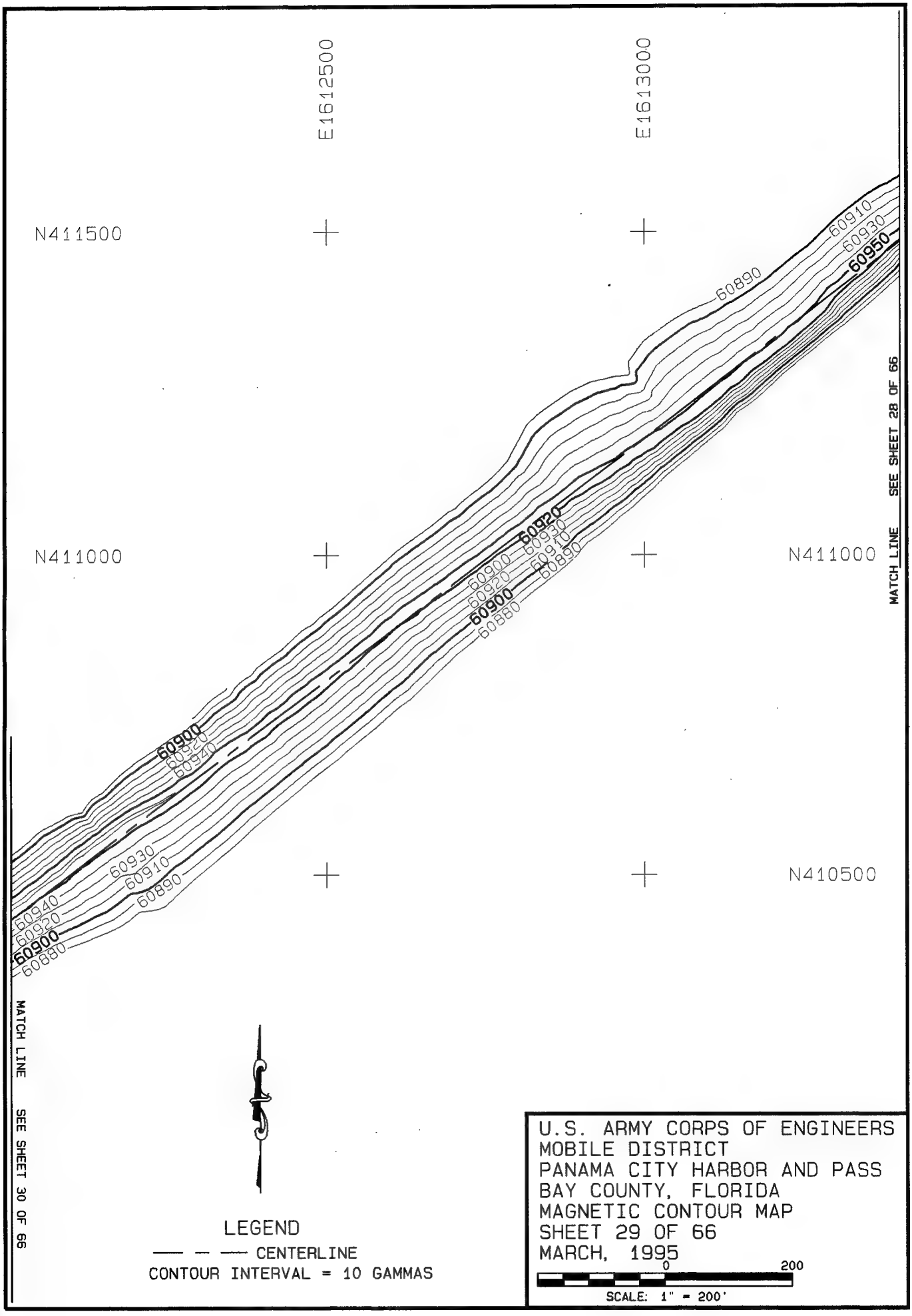
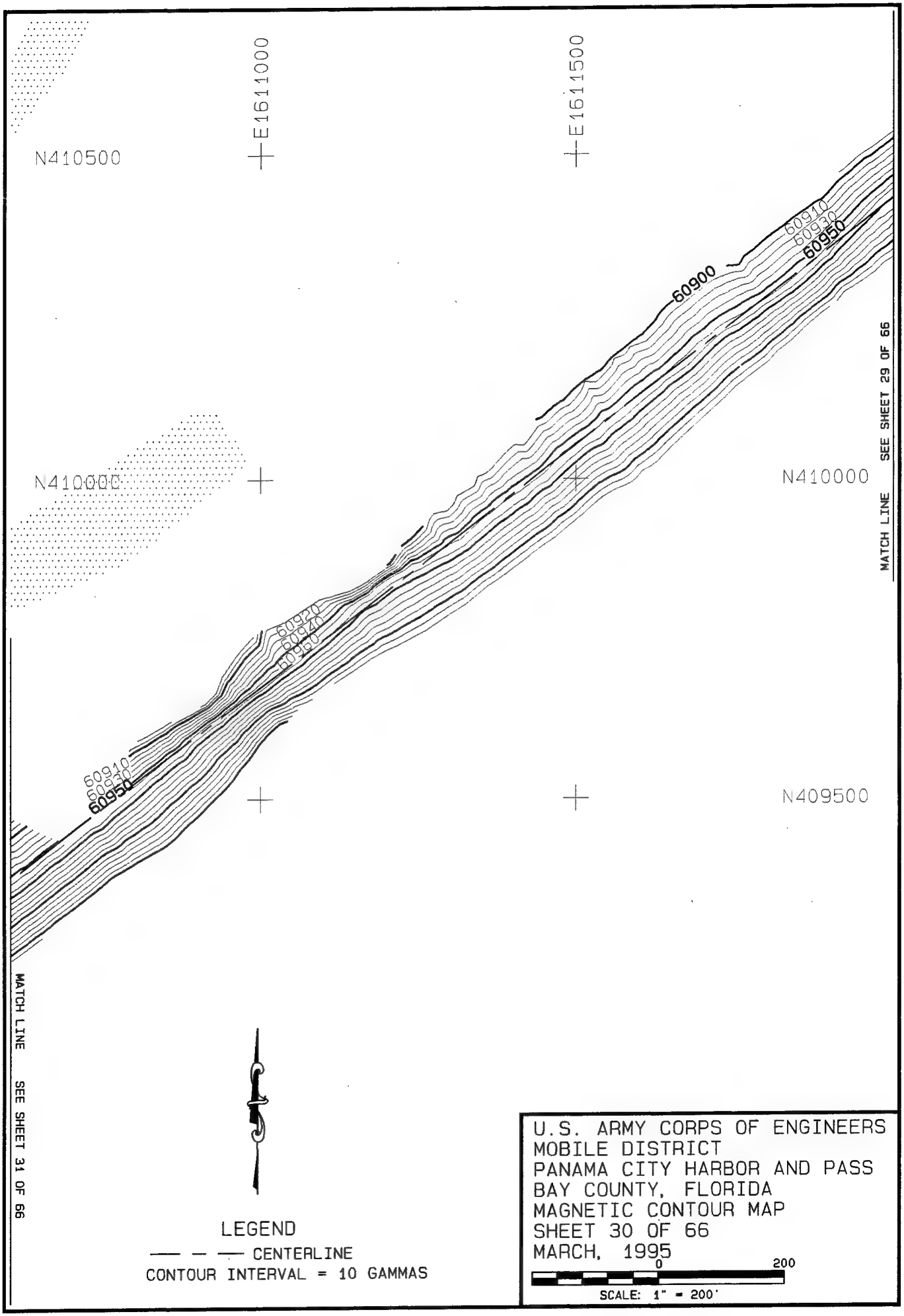
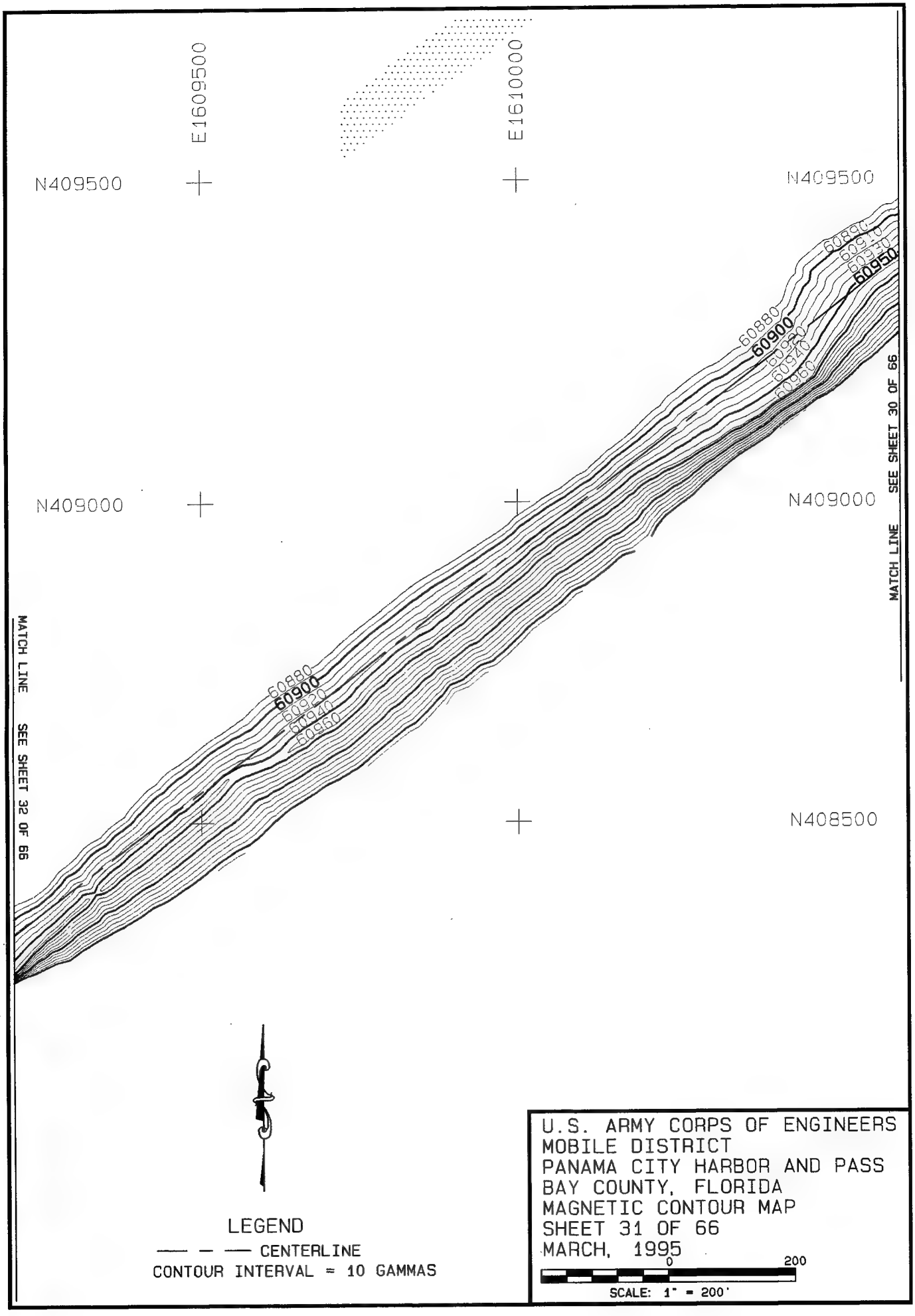
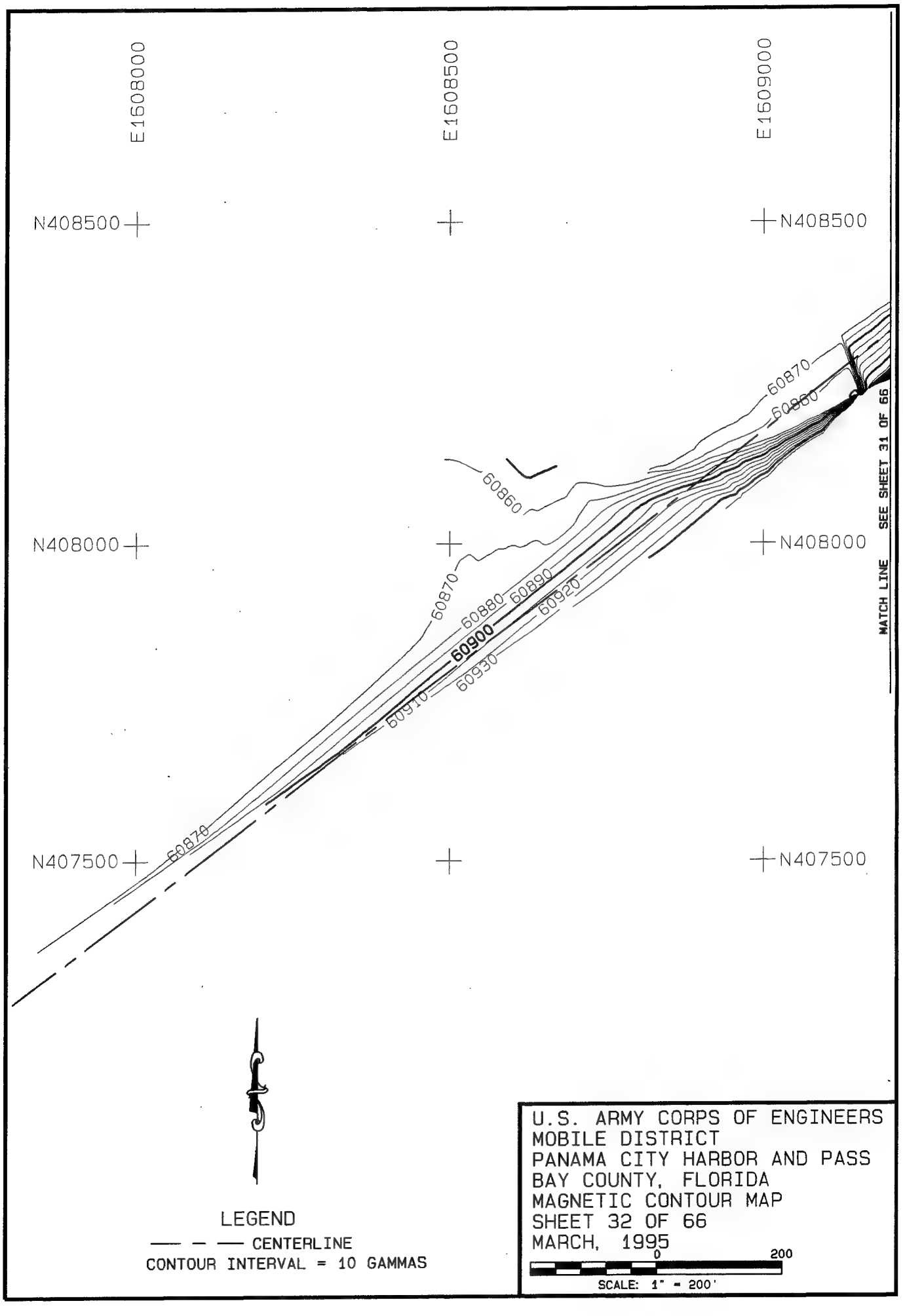
60880
60860
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 27 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1614000
E1614500
N412500
N412000
N411500
60900
60920
60940
60950
60930
60910
60890
60870
60880
MATCH LINE SEE SHEET 27 OF 66
MATCH LINE SEE SHEET 29 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 28 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1612500
E1613000
N411500
N411000
N410500
60890
60910
60930
60950
60900
60920
60940
60880
MATCH LINE SEE SHEET 28 OF 66
MATCH LINE SEE SHEET 30 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 29 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1611000
E1611500
N410500
N410000
N409500
60900
60910
60920
60930
60940
60950
60960
MATCH LINE SEE SHEET 29 OF 66
MATCH LINE SEE SHEET 31 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 30 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1609500
E1610000
N409500
N409500
N409000
N409000
N408500
60880
60900
60920
60940
60960
60880
60900
60920
60940
60960
60950
MATCH LINE SEE SHEET 30 OF 66
MATCH LINE SEE SHEET 32 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 10 GAMMAS
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 31 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

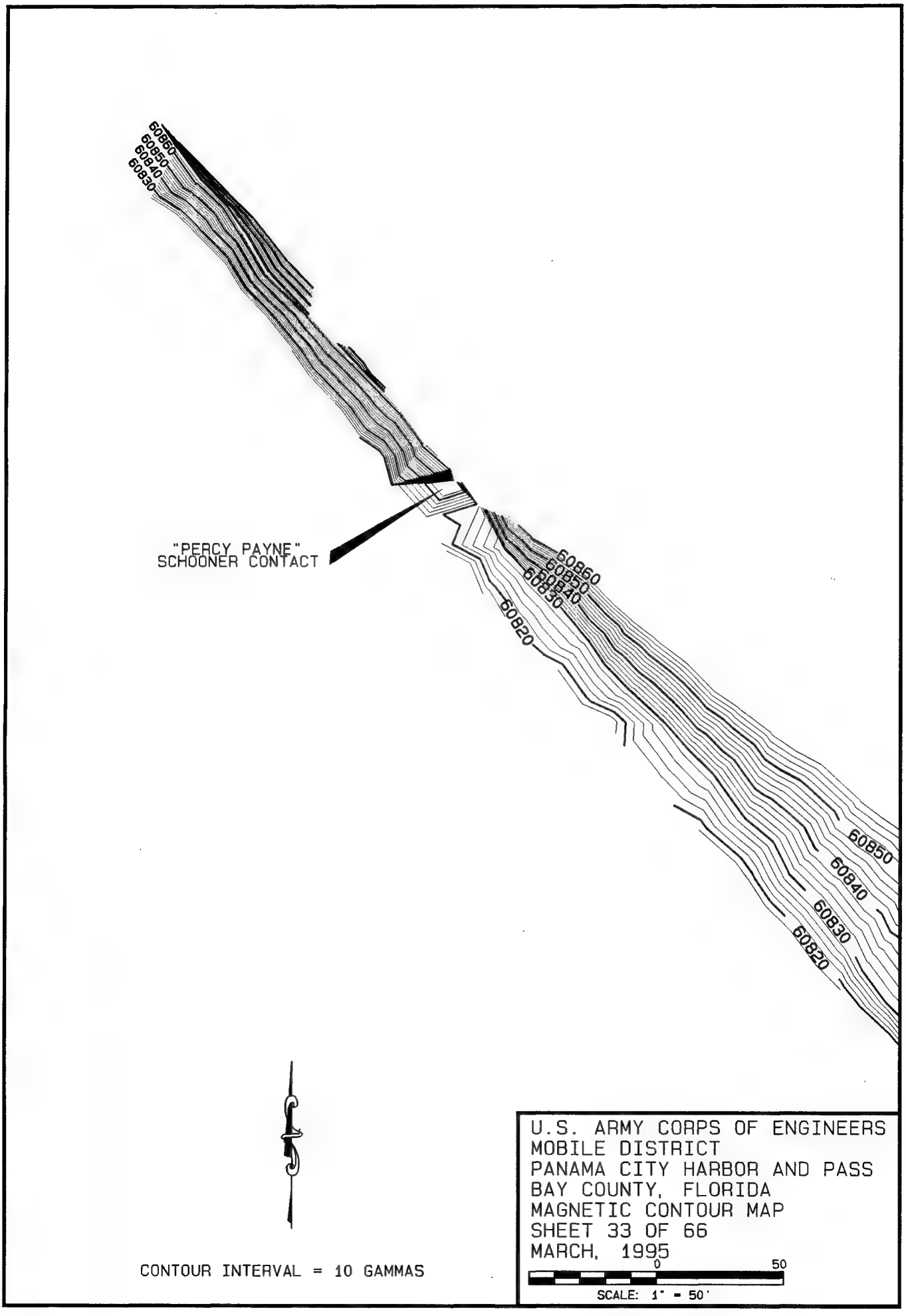
— — — CENTERLINE

CONTOUR INTERVAL = 10 GAMMAS

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 32 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'

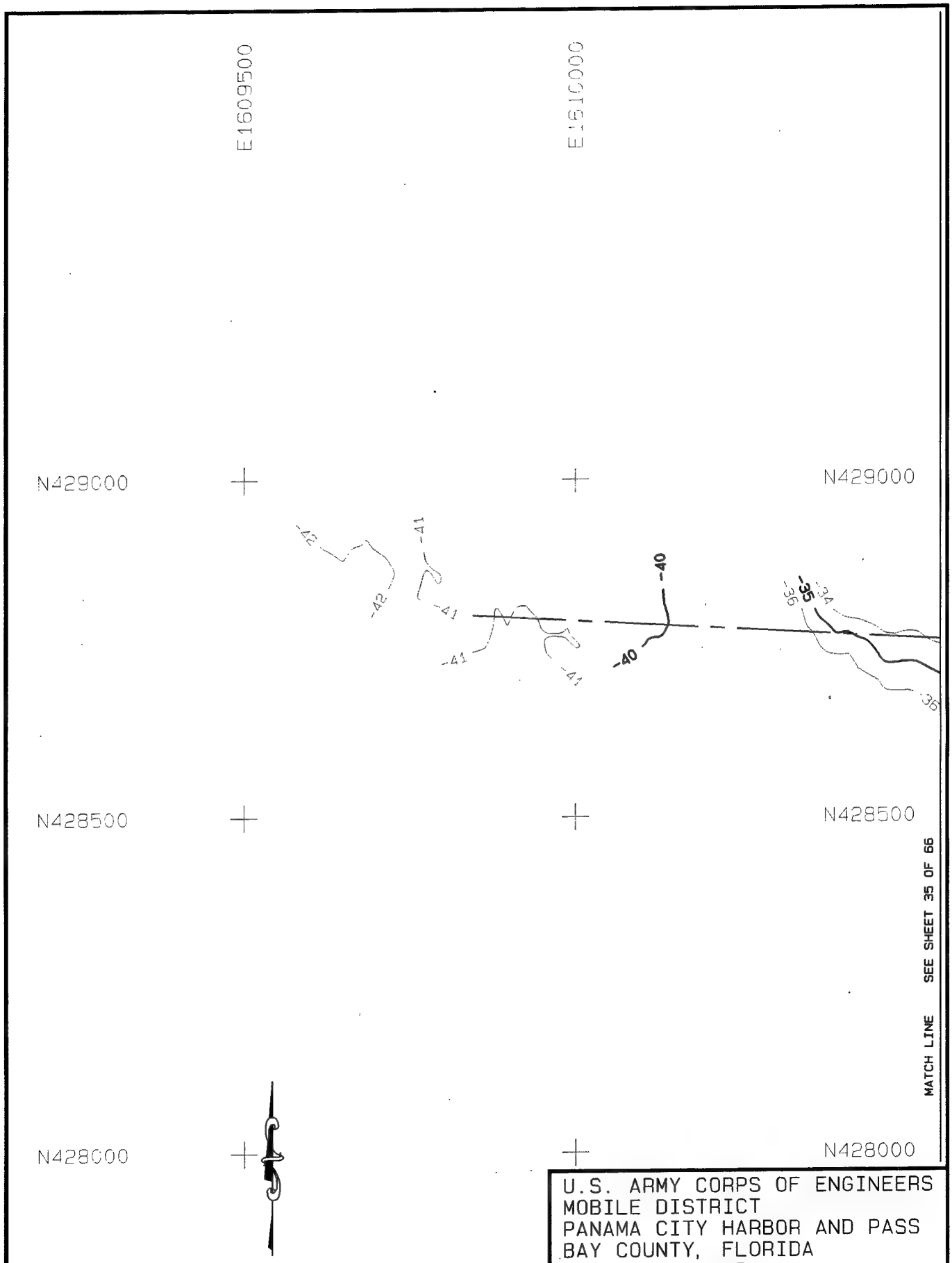


U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
MAGNETIC CONTOUR MAP
SHEET 33 OF 66
MARCH, 1995

0 50

SCALE: 1" = 50'

CONTOUR INTERVAL = 10 GAMMAS



LEGEND

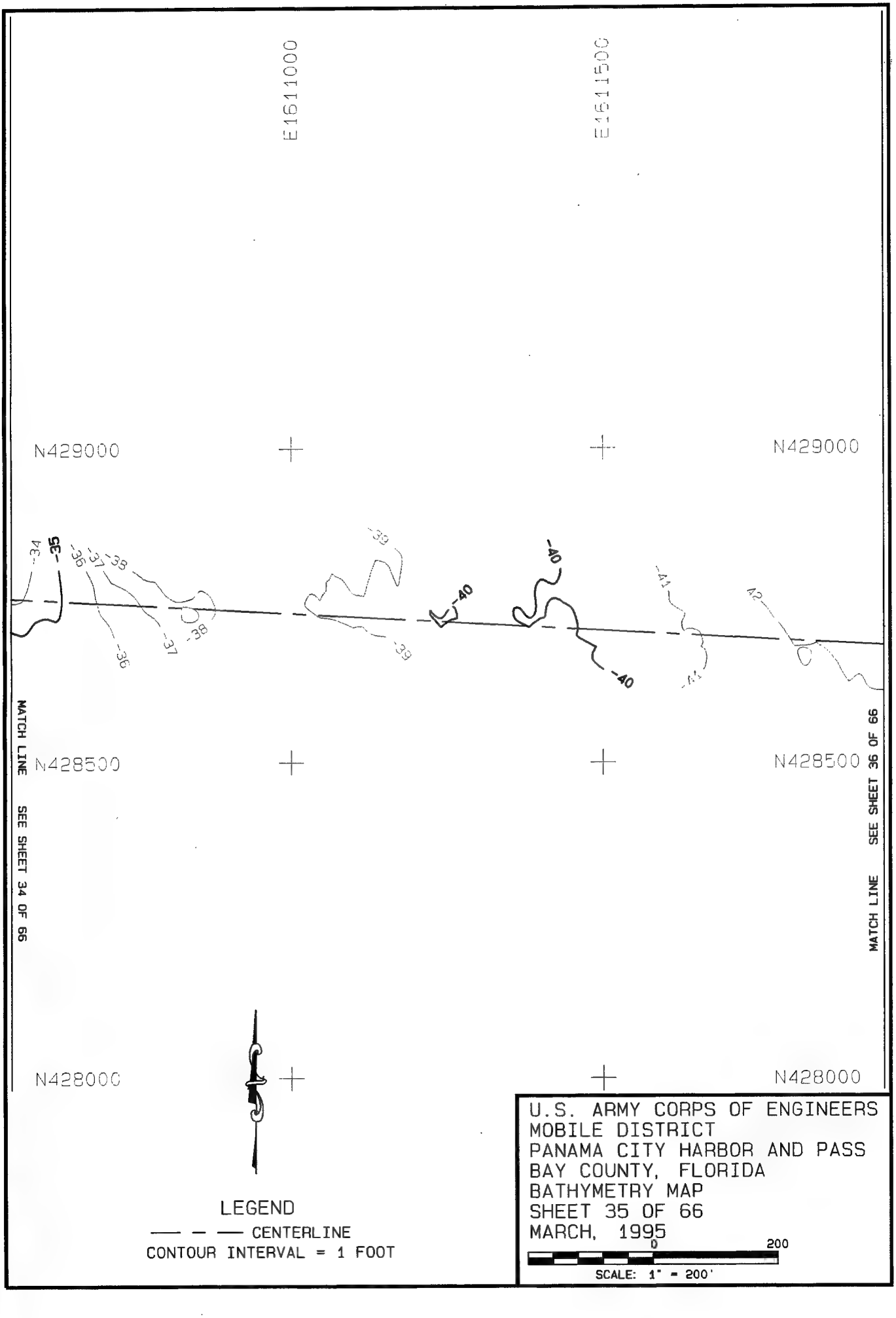
— — — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 34 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'



LEGEND

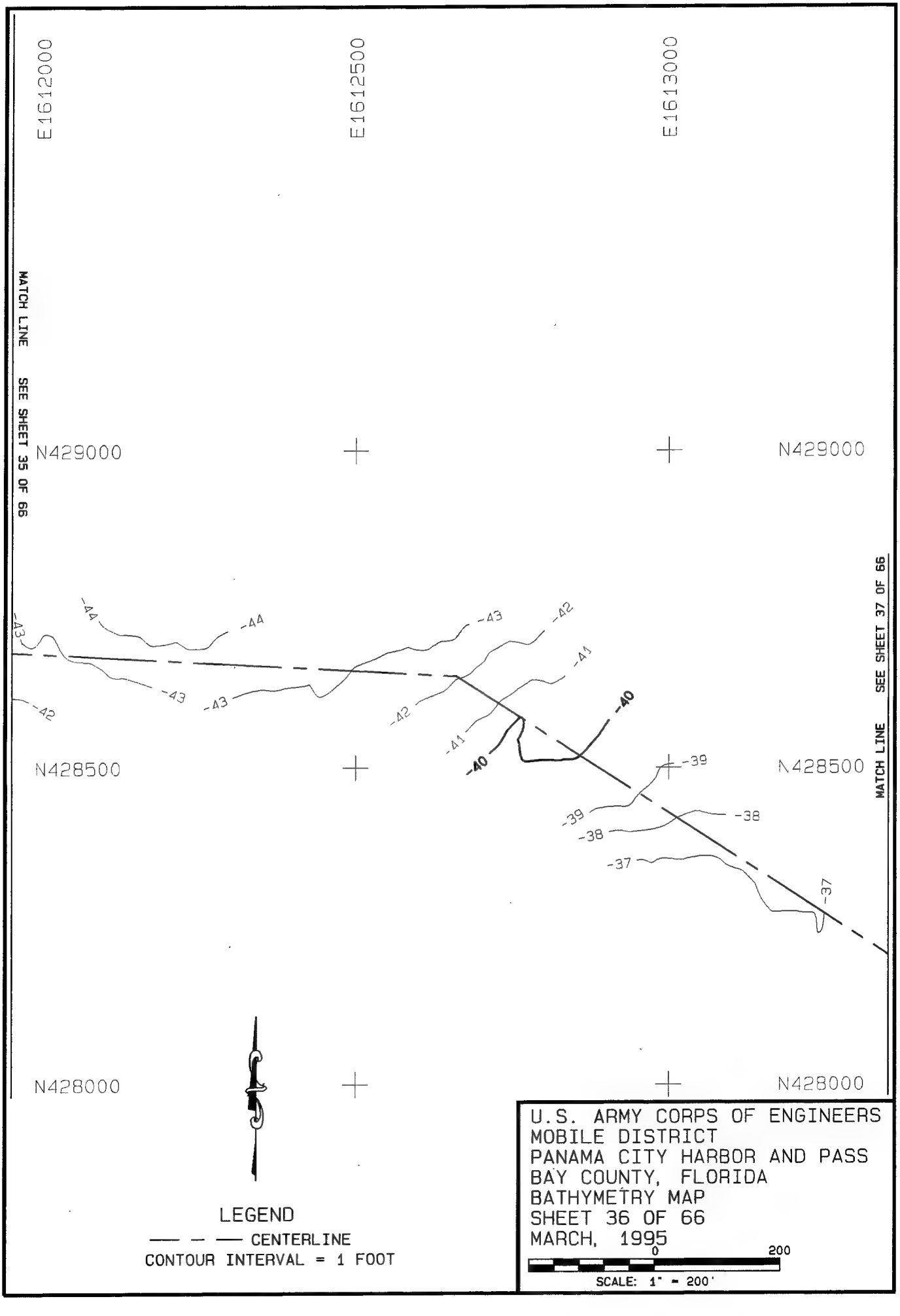
— – — CENTERLINE

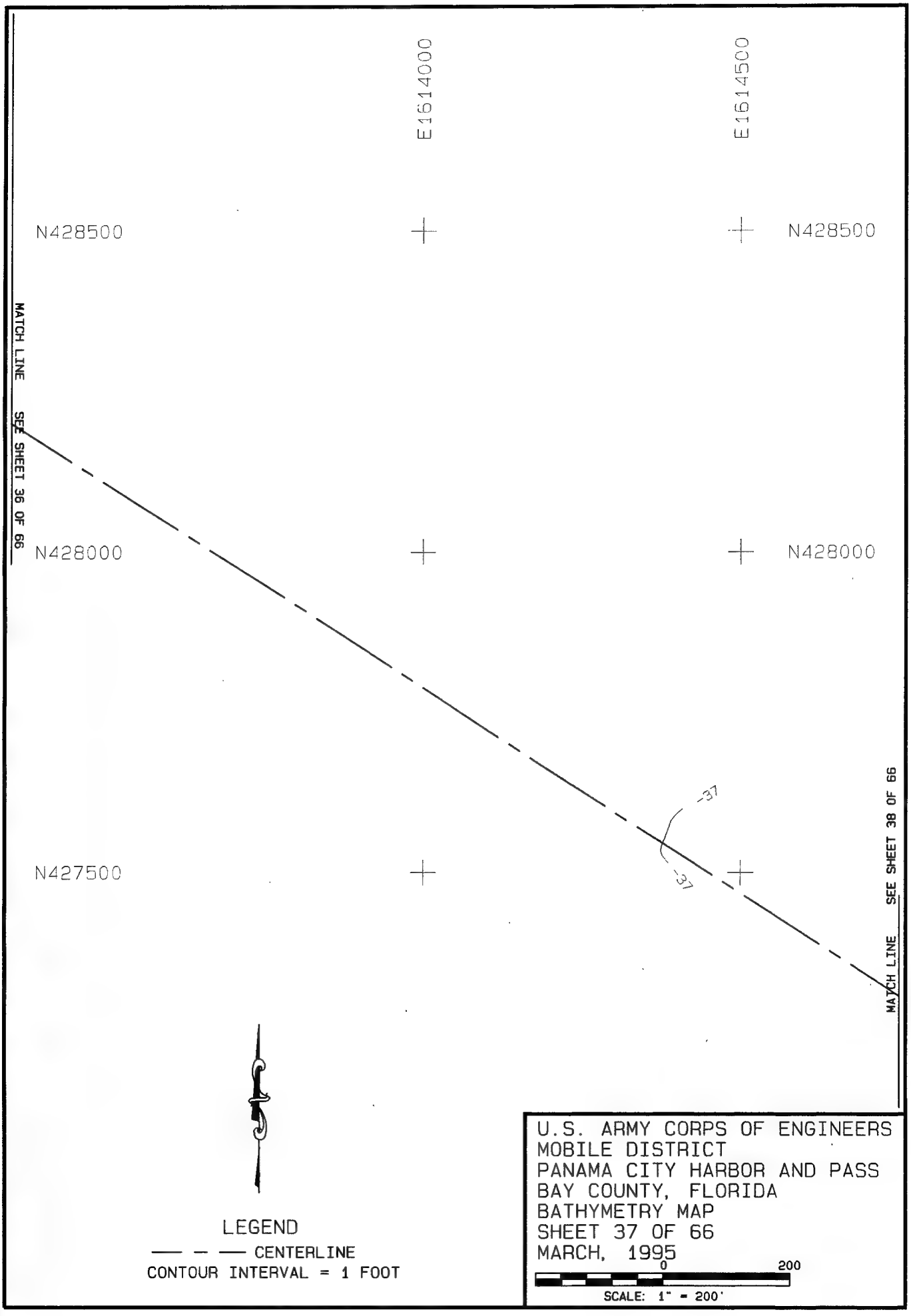
CONTOUR INTERVAL = 1 FOOT

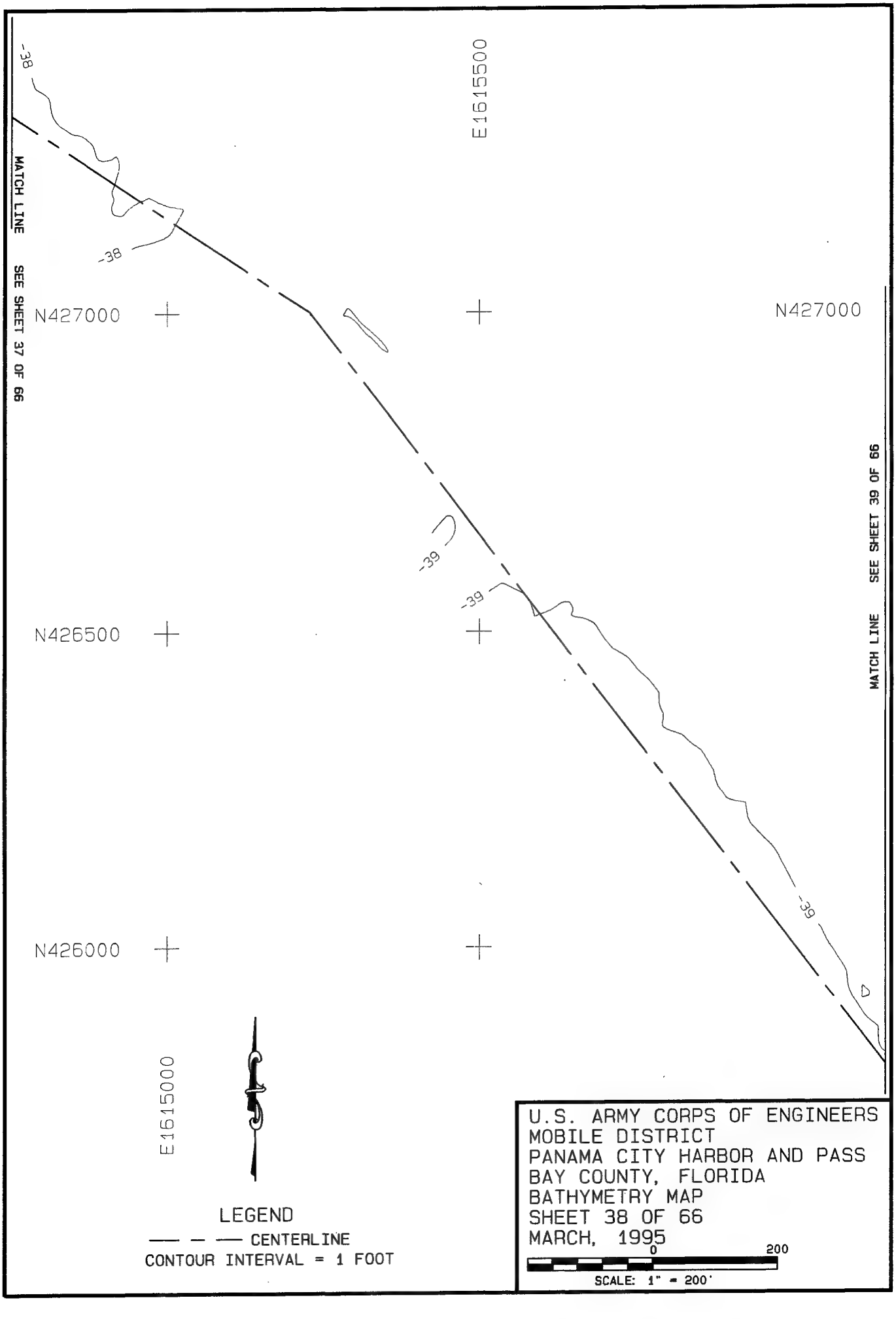
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 35 OF 66
MARCH, 1995

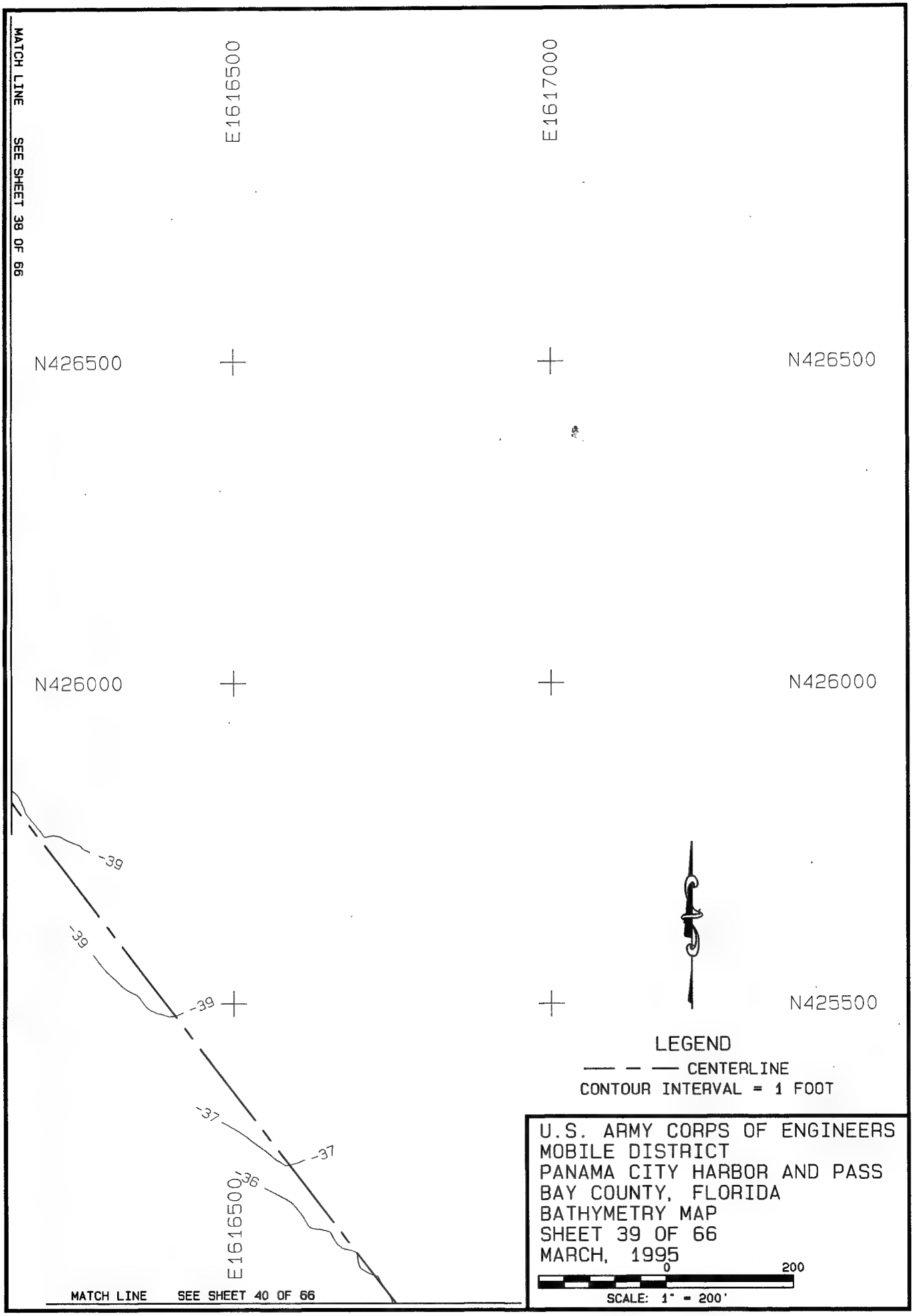
0 200

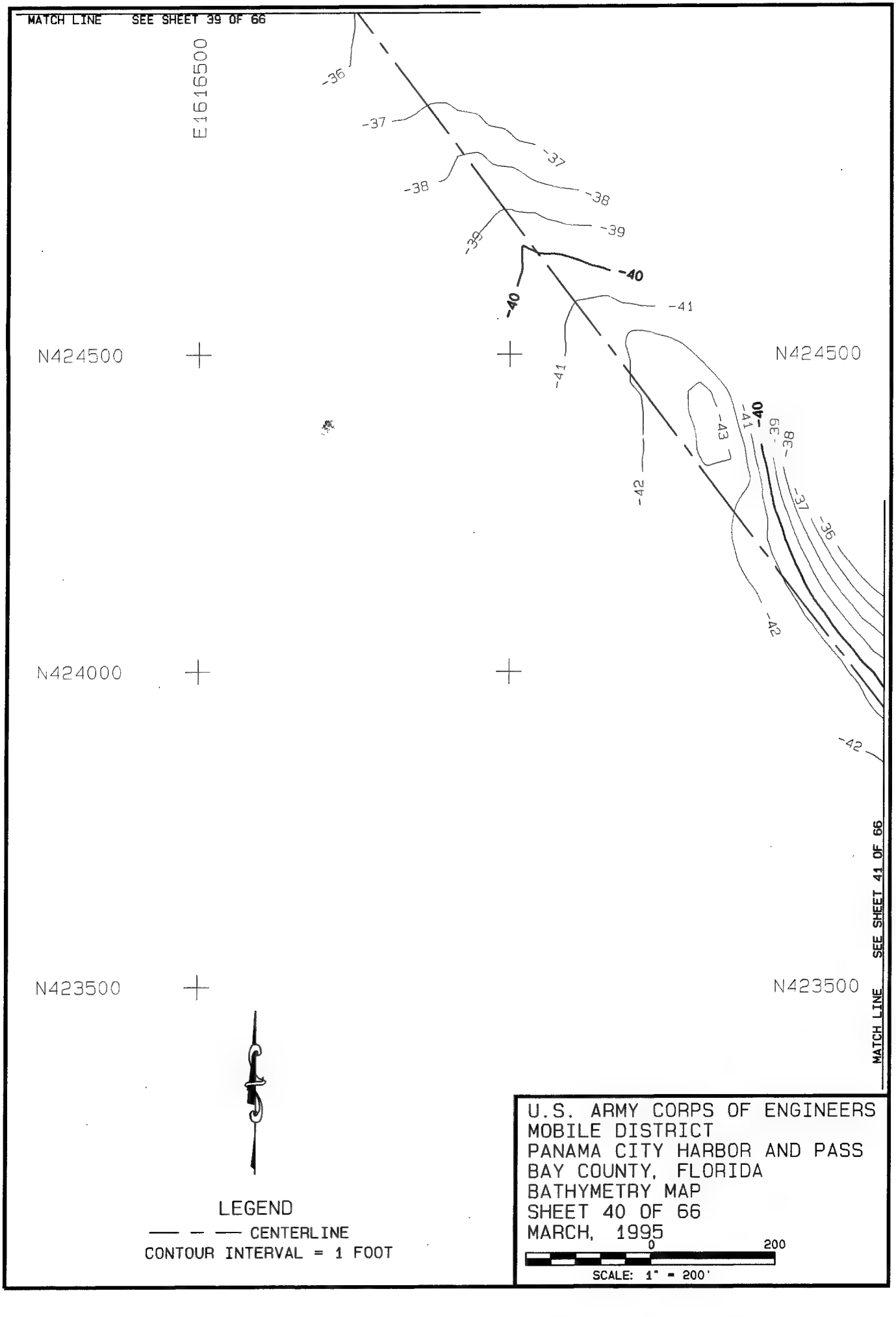
SCALE: 1" = 200'

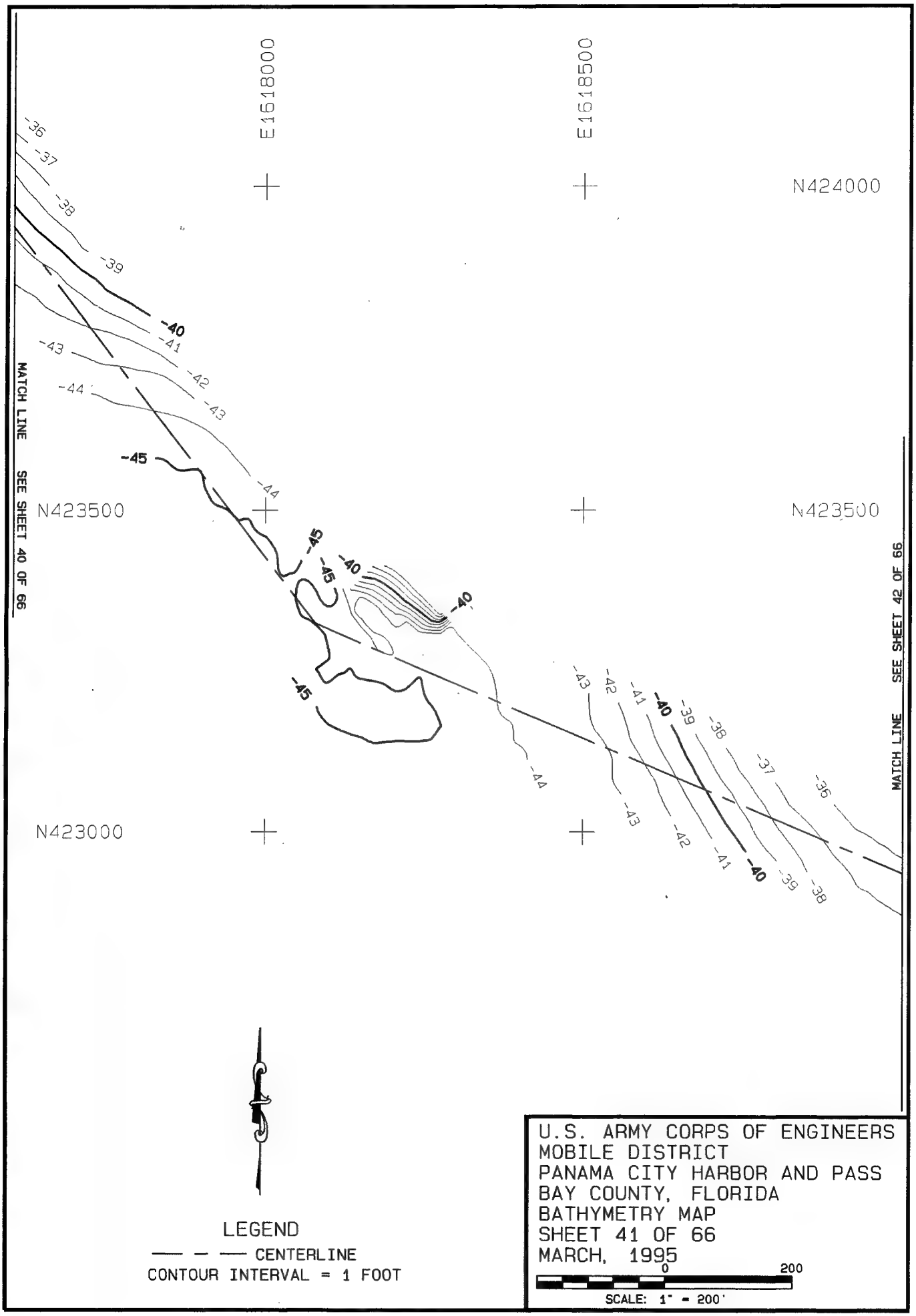

E1612000
E1612500
E1613000
N429000
N428500
N428000
MATCH LINE SEE SHEET 35 OF 66
MATCH LINE SEE SHEET 37 OF 66
-44
-43
-42
-41
-40
-39
-38
-37
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 36 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1614000
E1614500
N428500
N428500
MATCH LINE SEE SHEET 36 OF 66
N428000
N428000
-37
-37
N427500
MATCH LINE SEE SHEET 38 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 37 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1615500
E1615000
N427000
N426500
N426000
-38
-38
-39
-39
-39
MATCH LINE SEE SHEET 37 OF 66
MATCH LINE SEE SHEET 39 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 38 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


MATCH LINE SEE SHEET 38 OF 66
E1616500
E1617000
N426500
N426500
N426000
N426000
N425500
-39
-39
-39
-37
-37
-36
E1616500
MATCH LINE SEE SHEET 40 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 39 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


MATCH LINE SEE SHEET 39 OF 66
E1616500
-36
-37
-37
-38
-38
-39
-39
-40
-40
-41
-41
N424500
N424500
-41
-40
-43
-39
-38
-37
-36
-42
-42
N424000
-42
SEE SHEET 41 OF 66 MATCH LINE
N423500
N423500
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 40 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

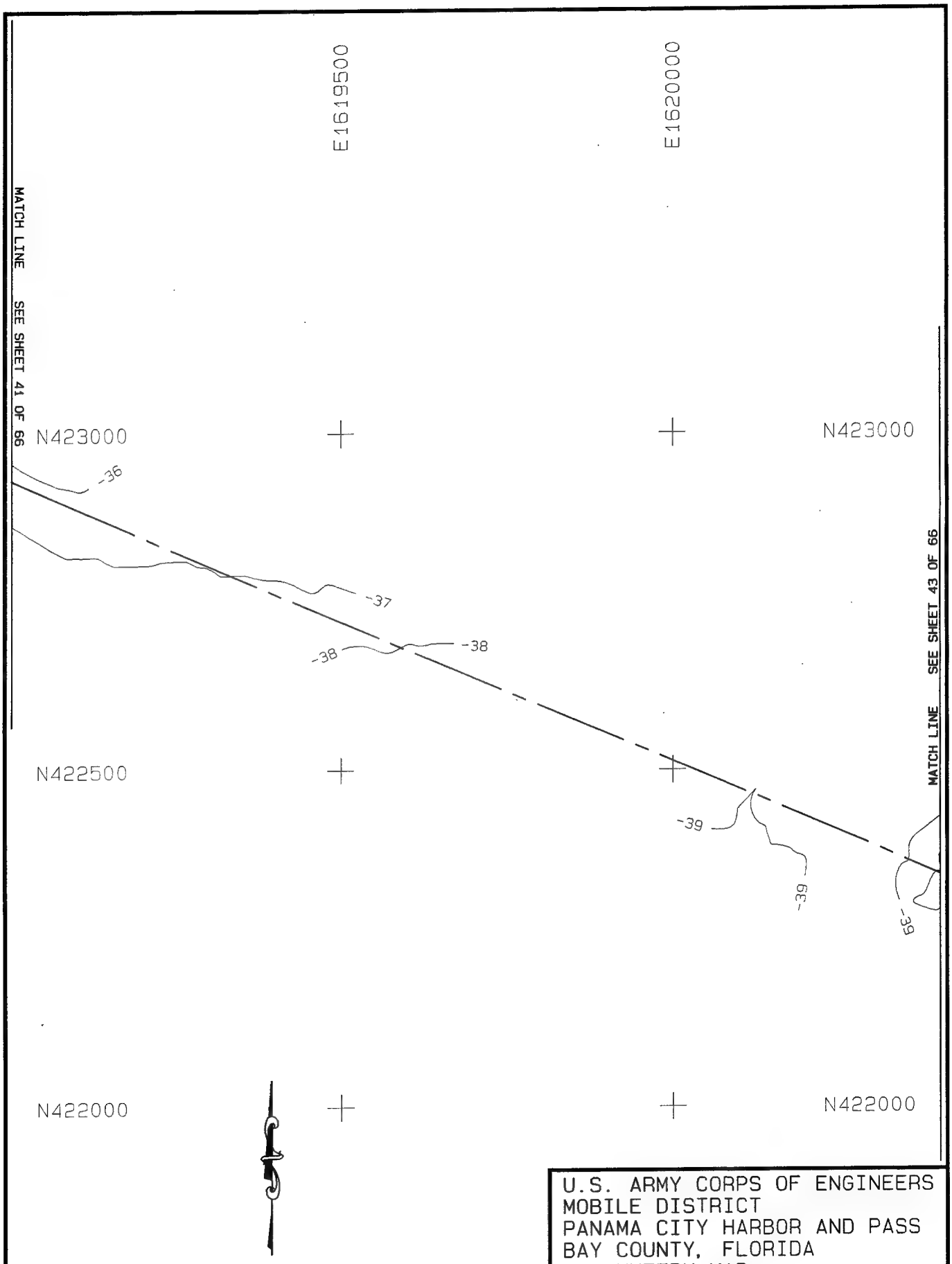
— — — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 41 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'



LEGEND

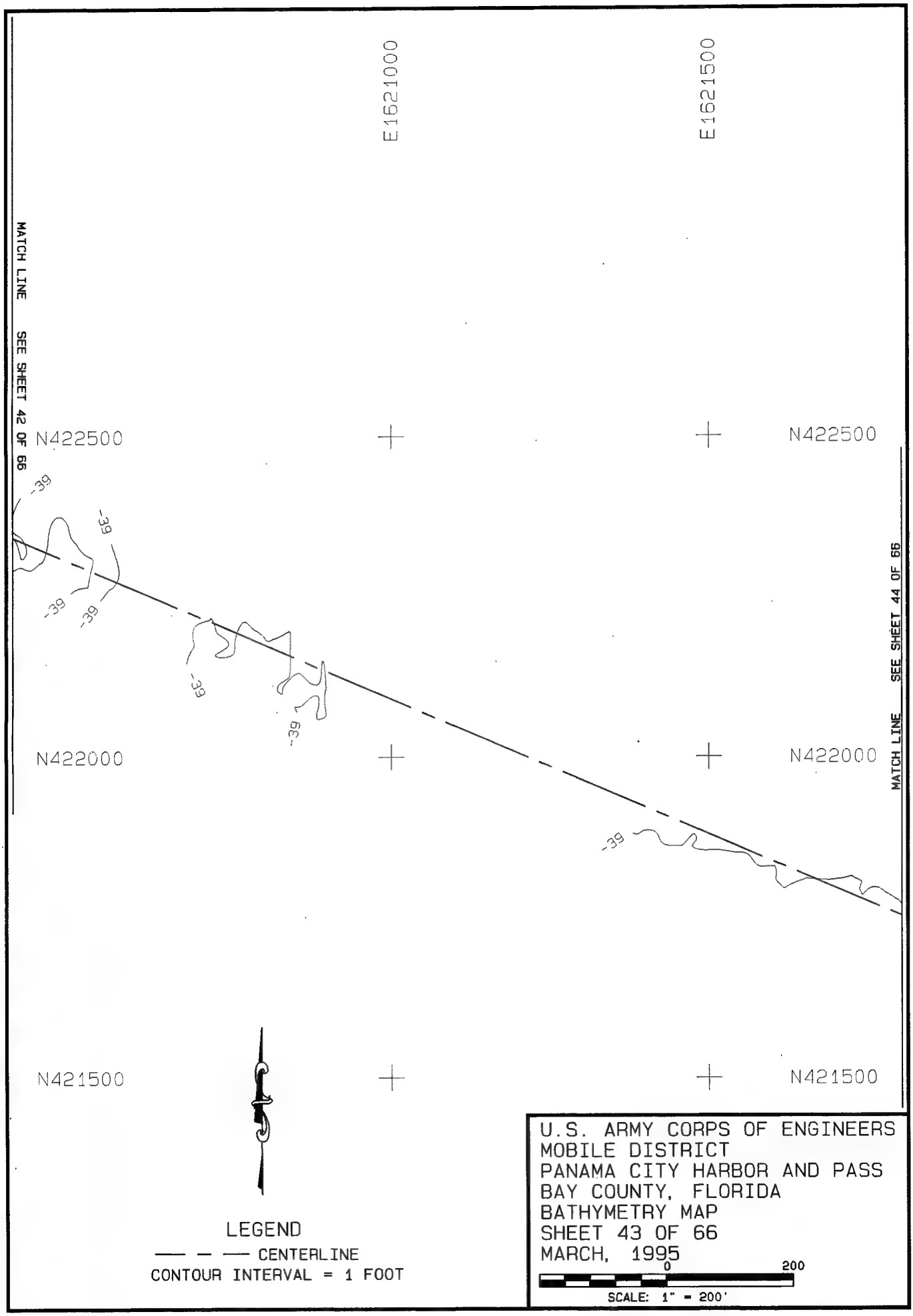
— — — CENTERLINE

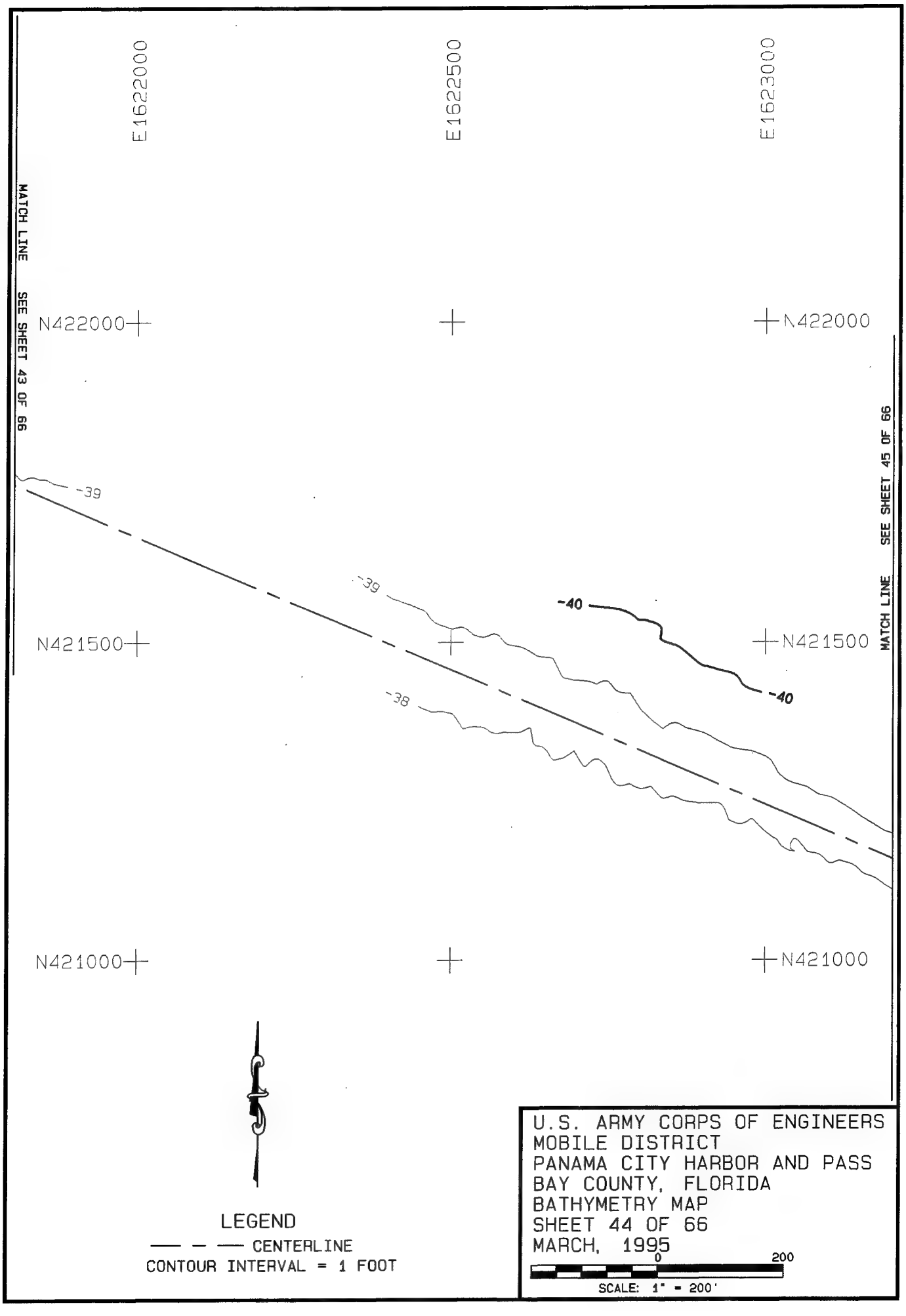
CONTOUR INTERVAL = 1 FOOT

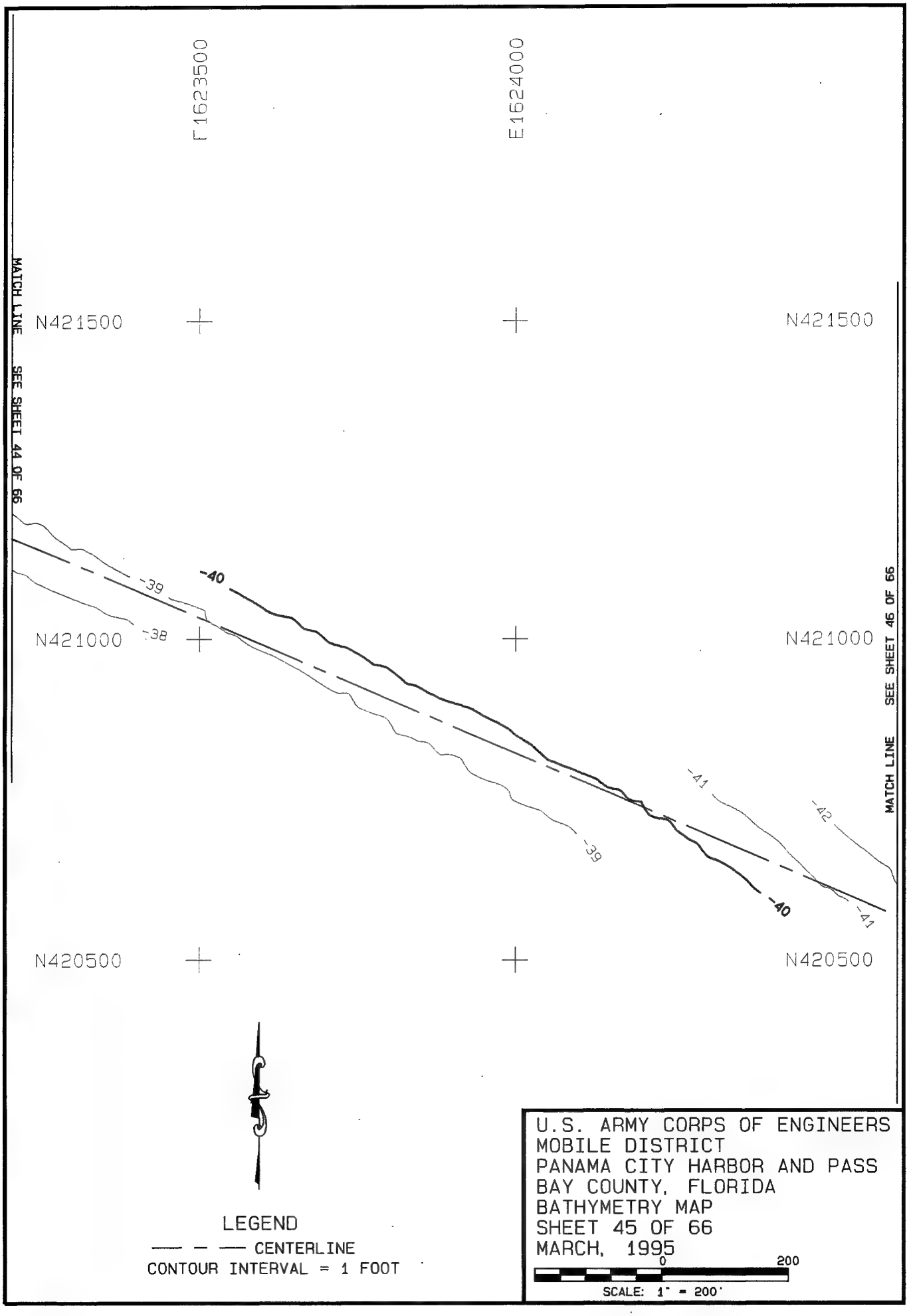
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 42 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'


E1621000
E1621500
MATCH LINE SEE SHEET 42 OF 66
N422500
N422500
-39
-39
-39
-39
-39
-39
-39
MATCH LINE SEE SHEET 44 OF 66
N422000
N422000
N421500
N421500
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 43 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1622000
E1622500
E1623000
MATCH LINE SEE SHEET 43 OF 66
MATCH LINE SEE SHEET 45 OF 66
N422000
N421500
N421000
-39
-38
-40
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 44 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

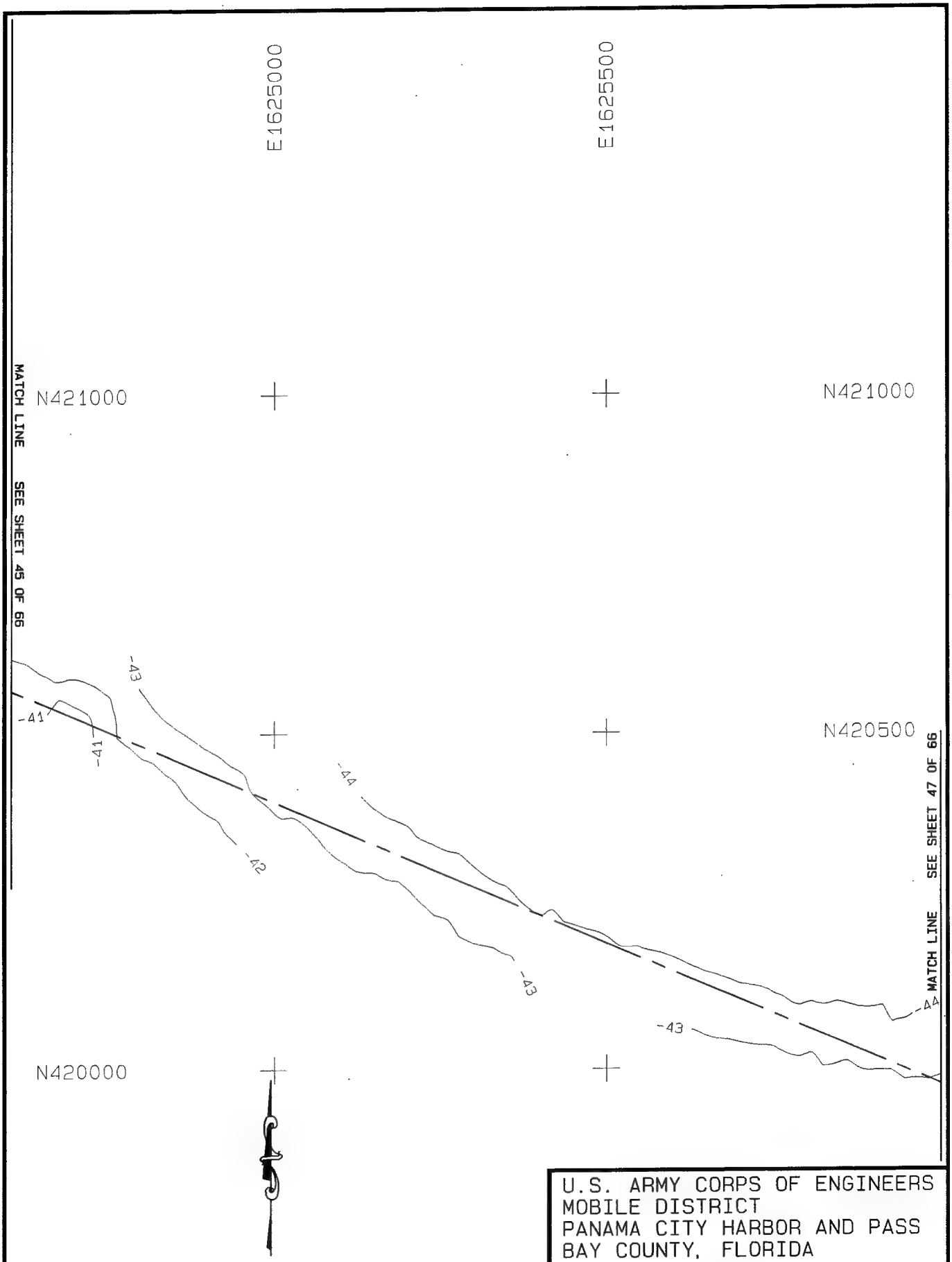
— — — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 45 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'



LEGEND

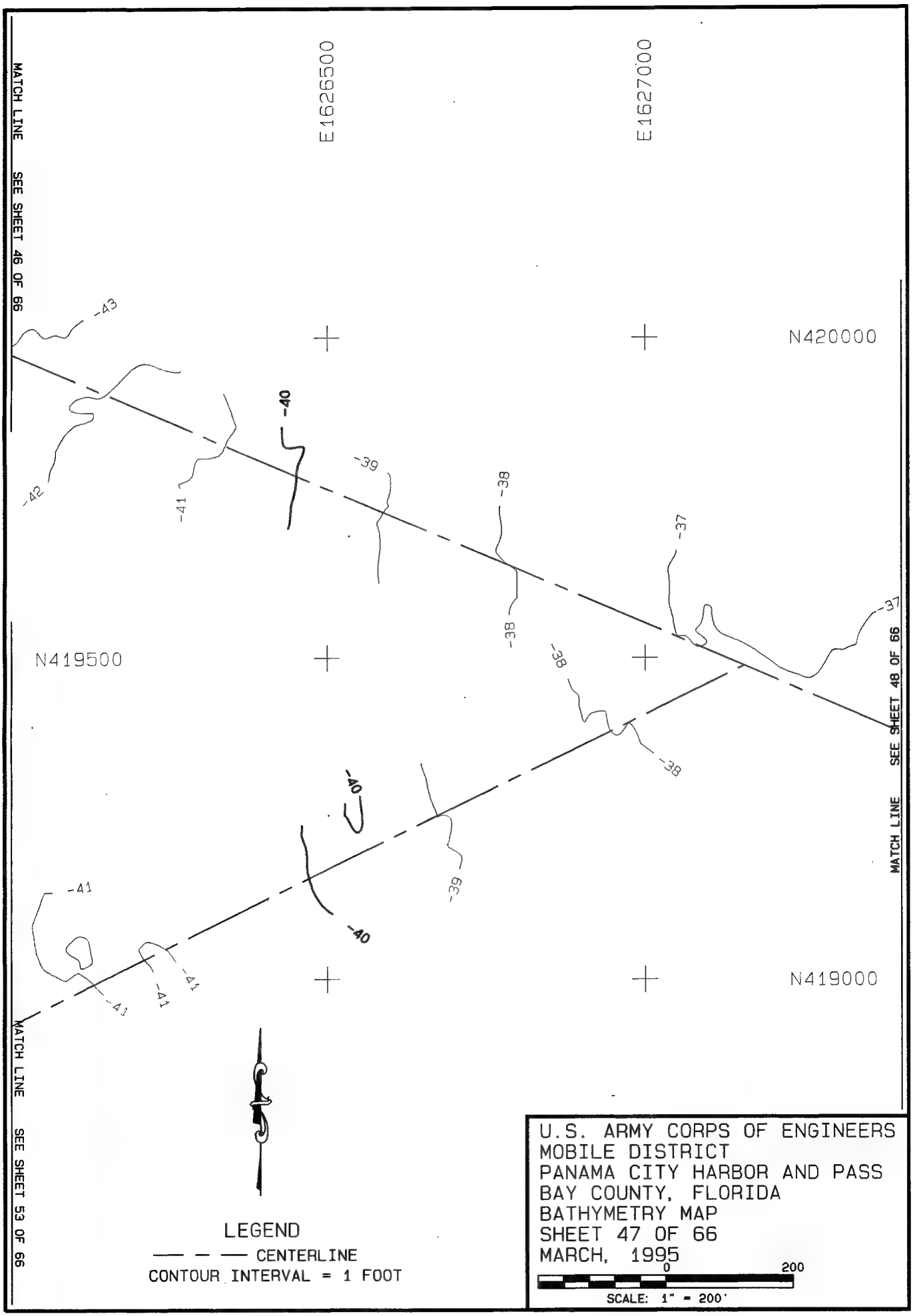
— – — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 46 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'



LEGEND

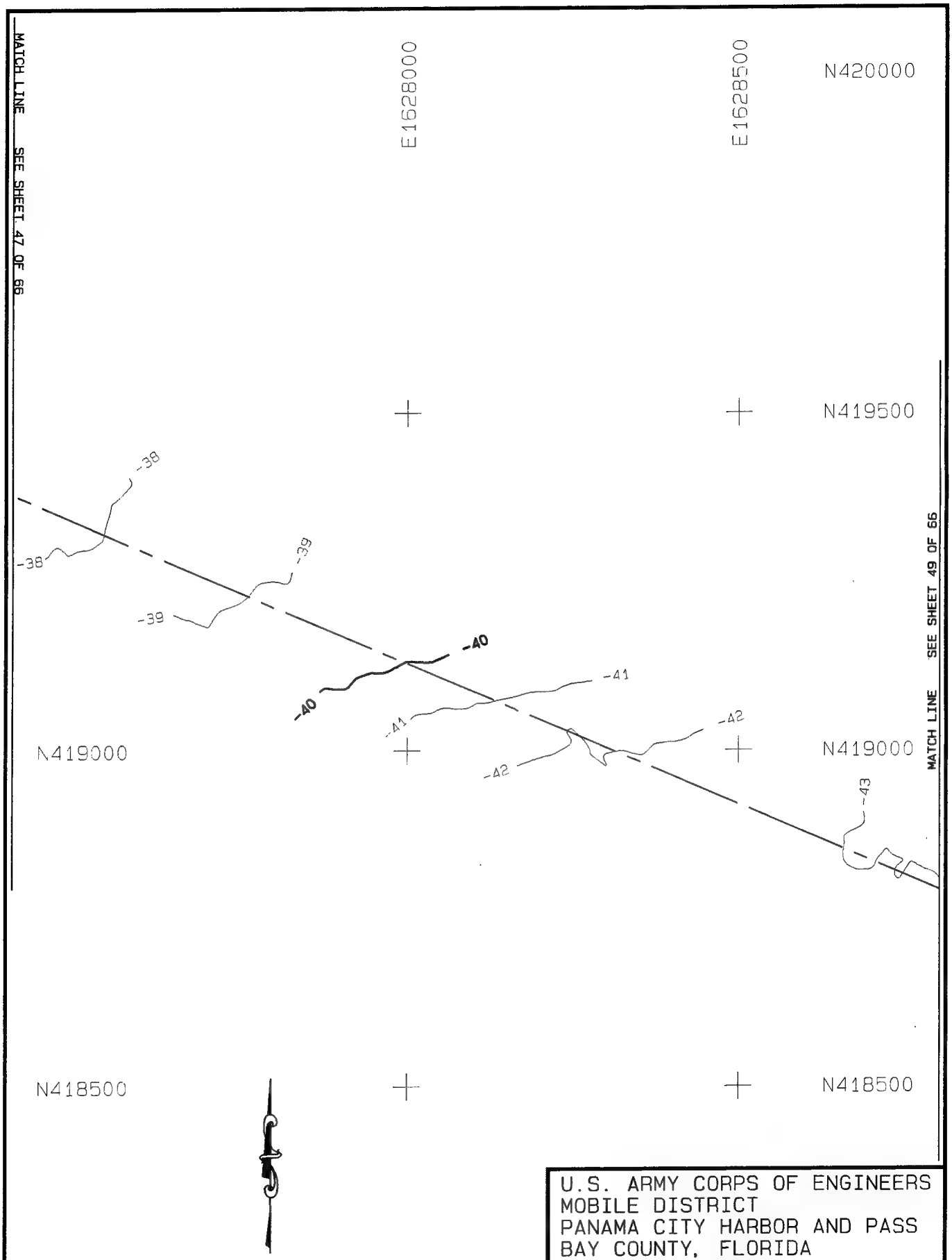
— — — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 47 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'



LEGEND

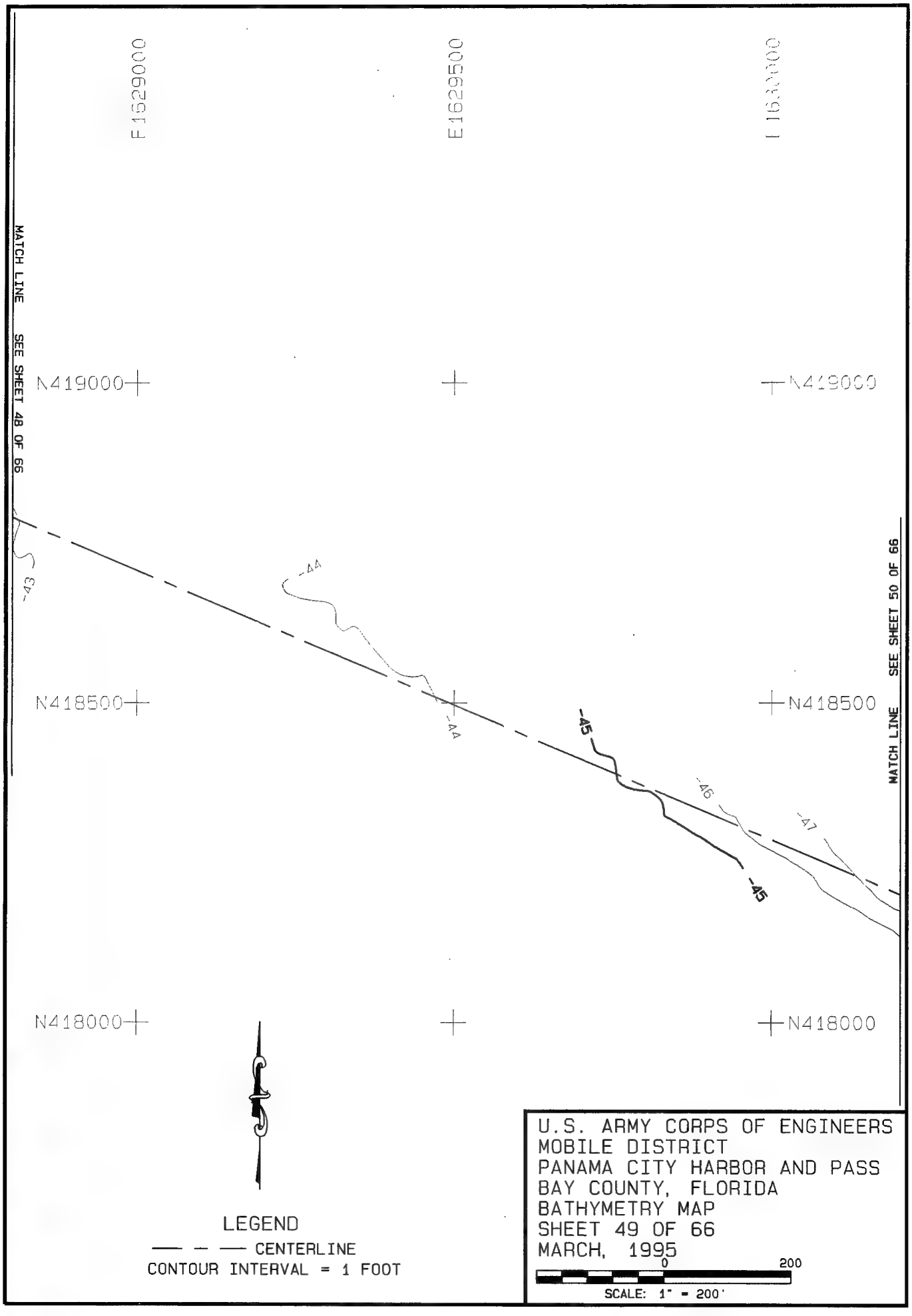
— – — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 48 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'



LEGEND

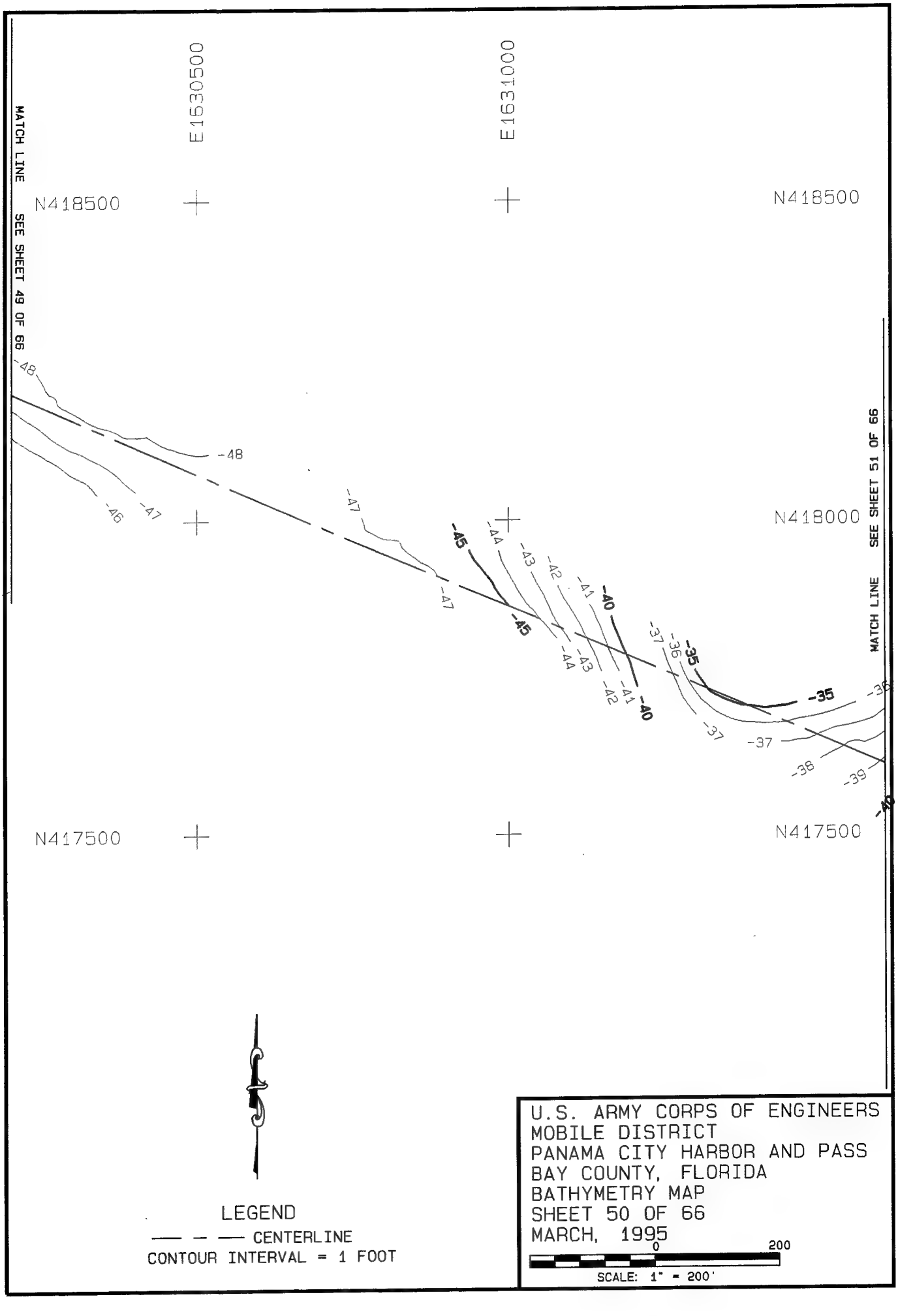
— – — CENTERLINE

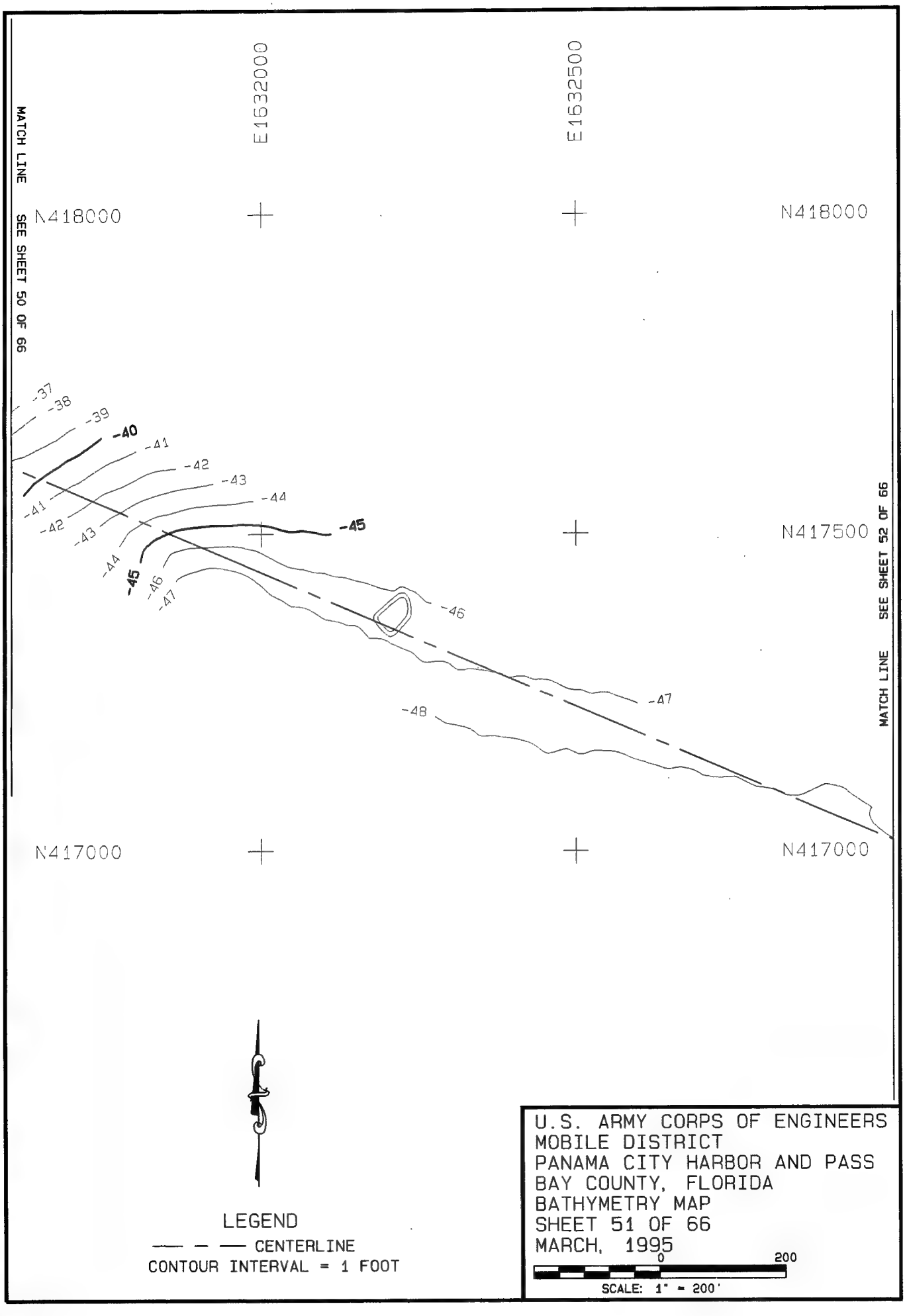
CONTOUR INTERVAL = 1 FOOT

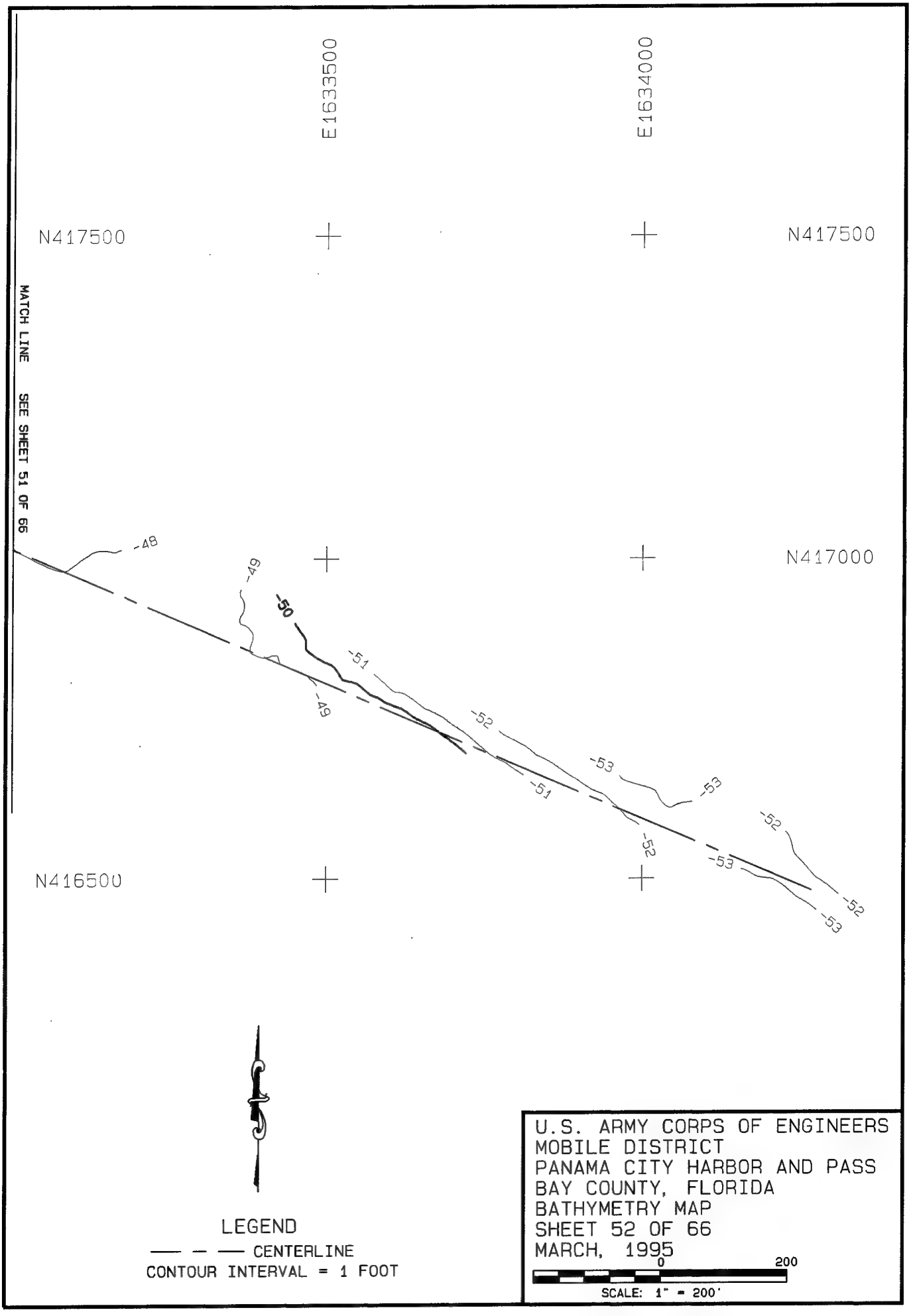
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 49 OF 66
MARCH, 1995

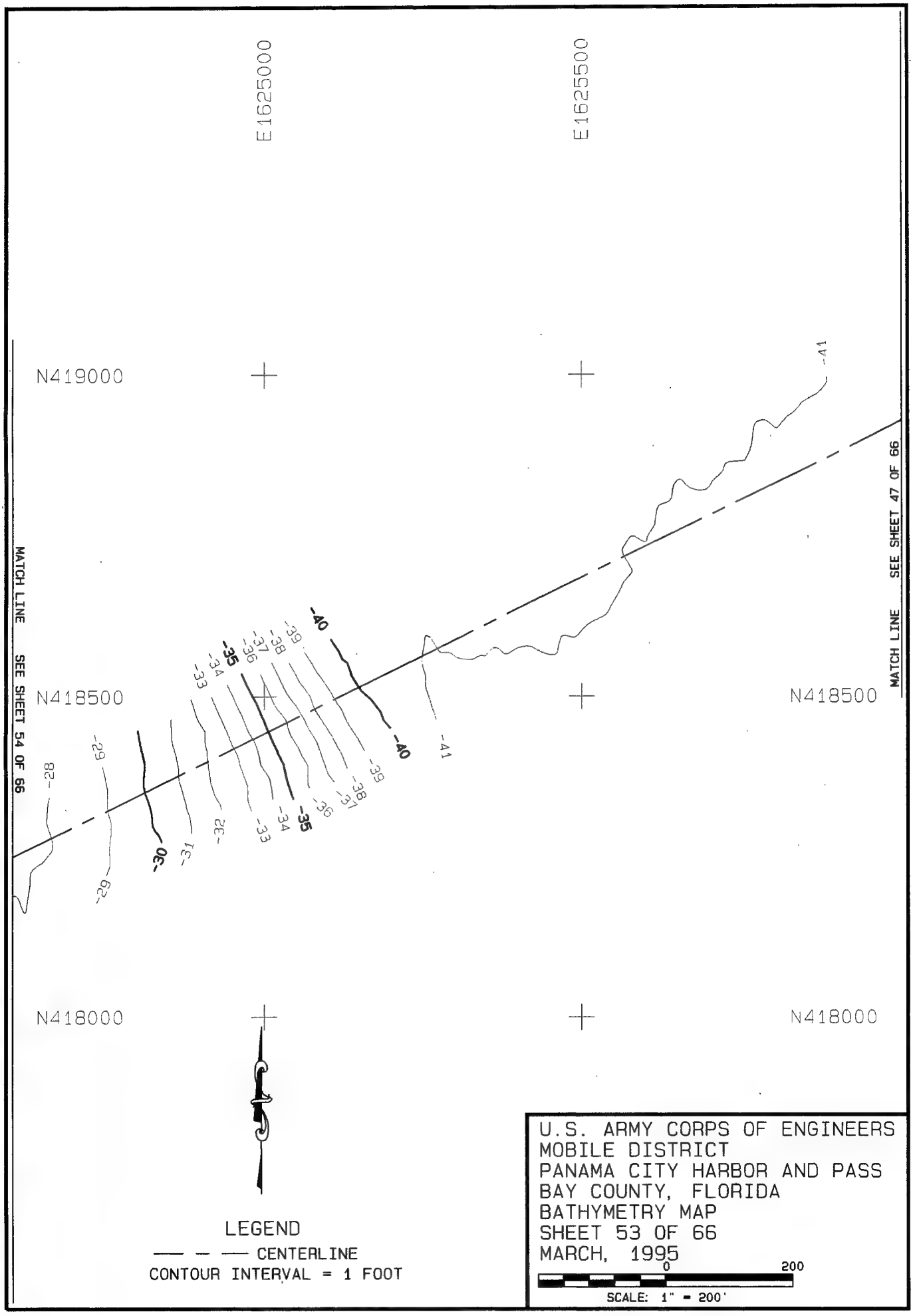
0 200

SCALE: 1" = 200'


E1630500
E1631000
N418500
N418500
N418000
N417500
N417500
MATCH LINE SEE SHEET 49 OF 66
MATCH LINE SEE SHEET 51 OF 66
-48
-47
-46
-45
-44
-43
-42
-41
-40
-37
-36
-35
-38
-39
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 50 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1632000
E1632500
N418000
N418000
N417500
N417000
N417000
MATCH LINE
SEE SHEET 50 OF 66
MATCH LINE
SEE SHEET 52 OF 66
-37
-38
-39
-40
-41
-42
-43
-44
-45
-46
-47
-48
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 51 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1633500
E1634000
N417500
N417500
N417000
N416500
MATCH LINE SEE SHEET 51 OF 66
-48
-49
-50
-51
-49
-52
-53
-51
-53
-52
-52
-53
-53
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 52 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

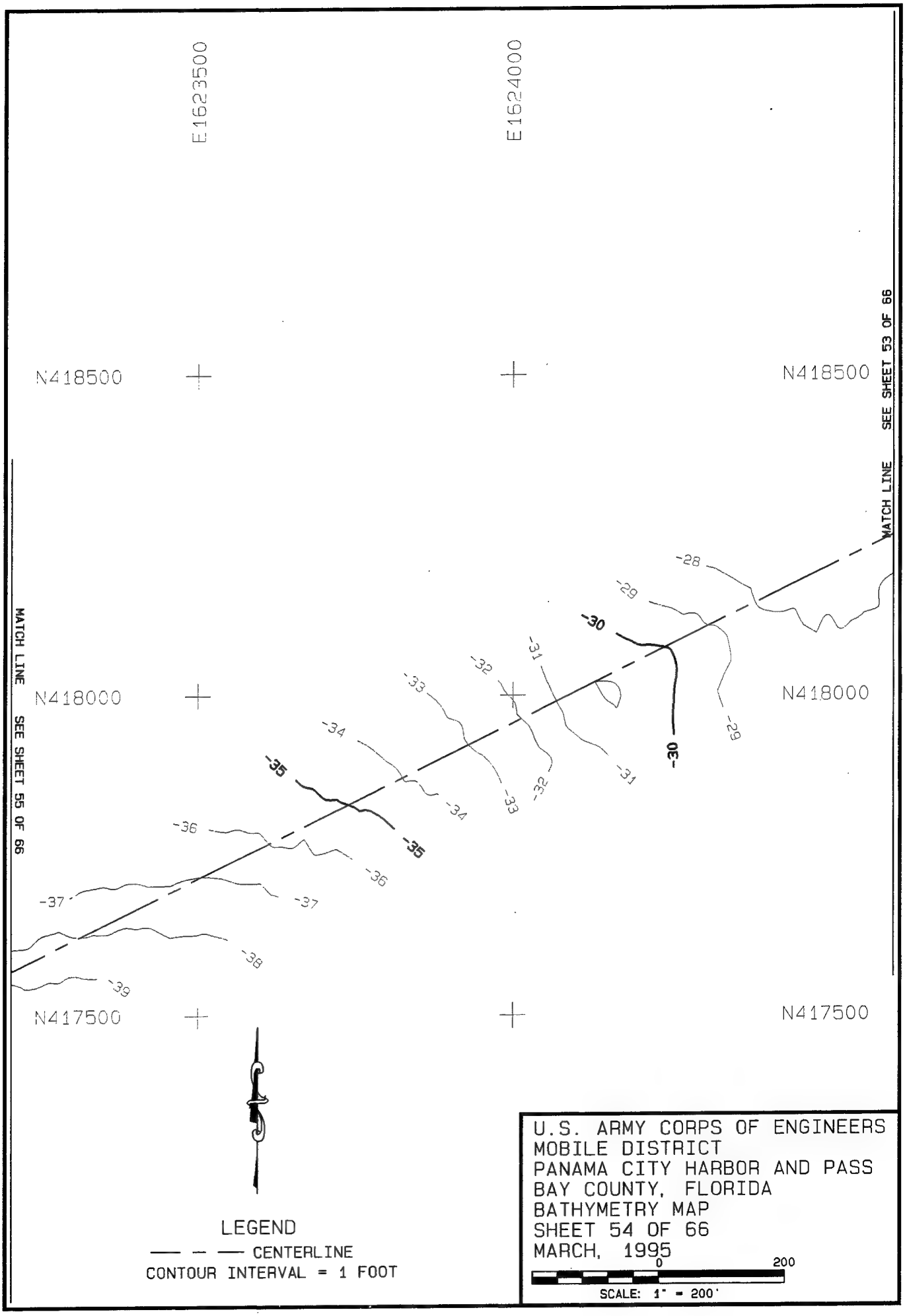
—— – —— CENTERLINE

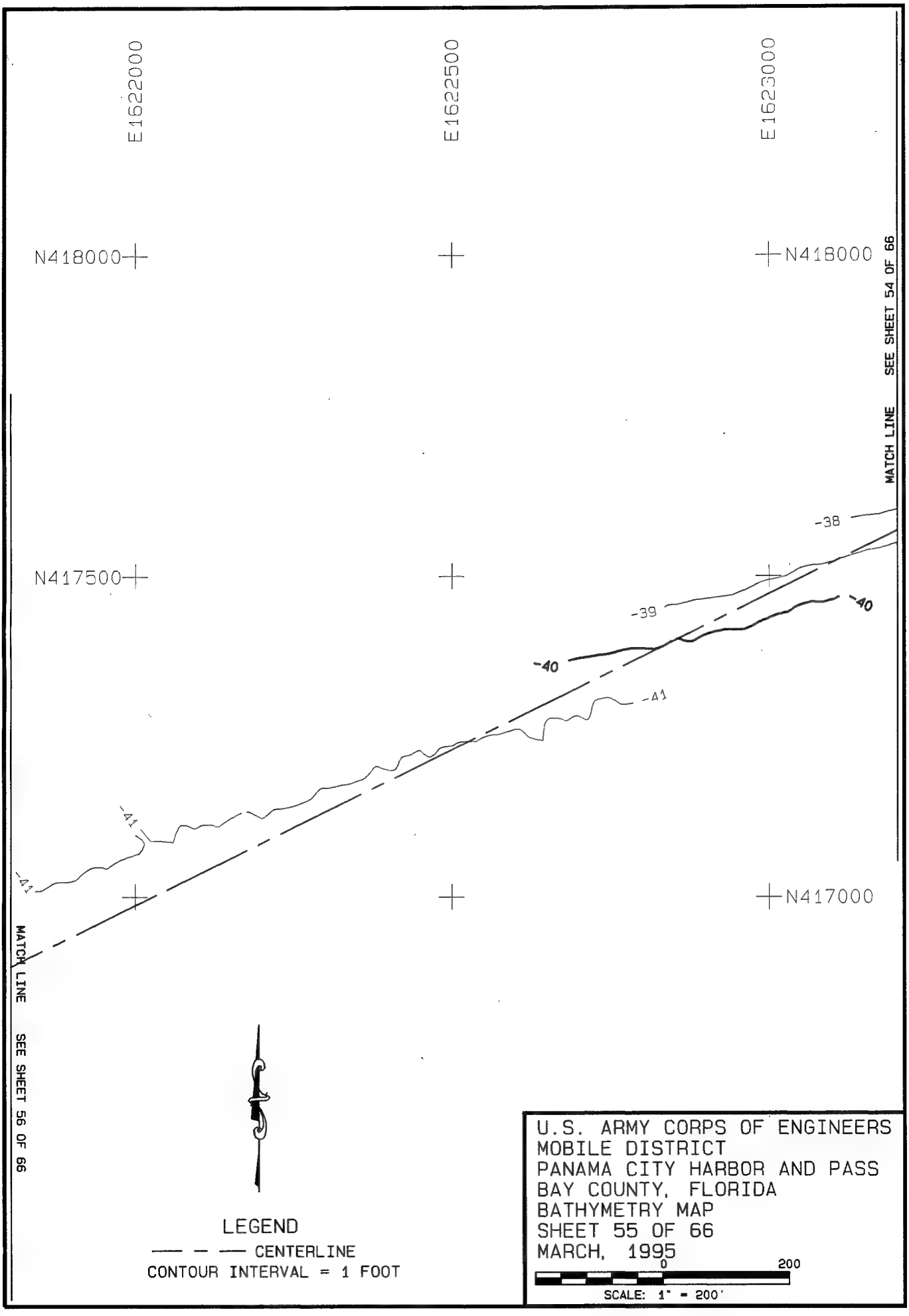
CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 53 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'


E1623500
E1624000
N418500
N418500
N418000
N418000
N417500
N417500
MATCH LINE SEE SHEET 53 OF 66
MATCH LINE SEE SHEET 55 OF 66
-28
-29
-30
-31
-32
-33
-34
-35
-36
-37
-38
-39
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 54 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

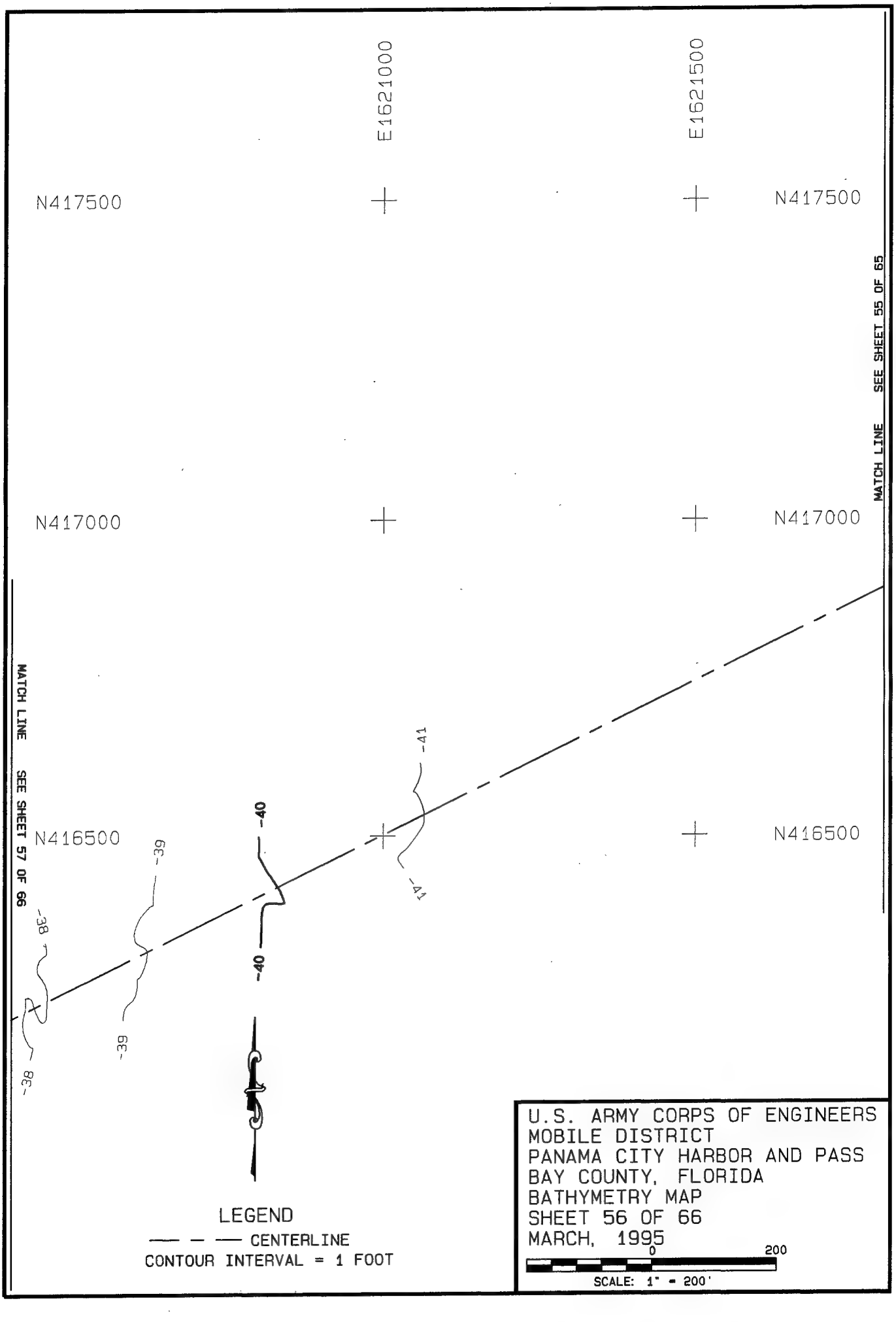
— — — CENTERLINE

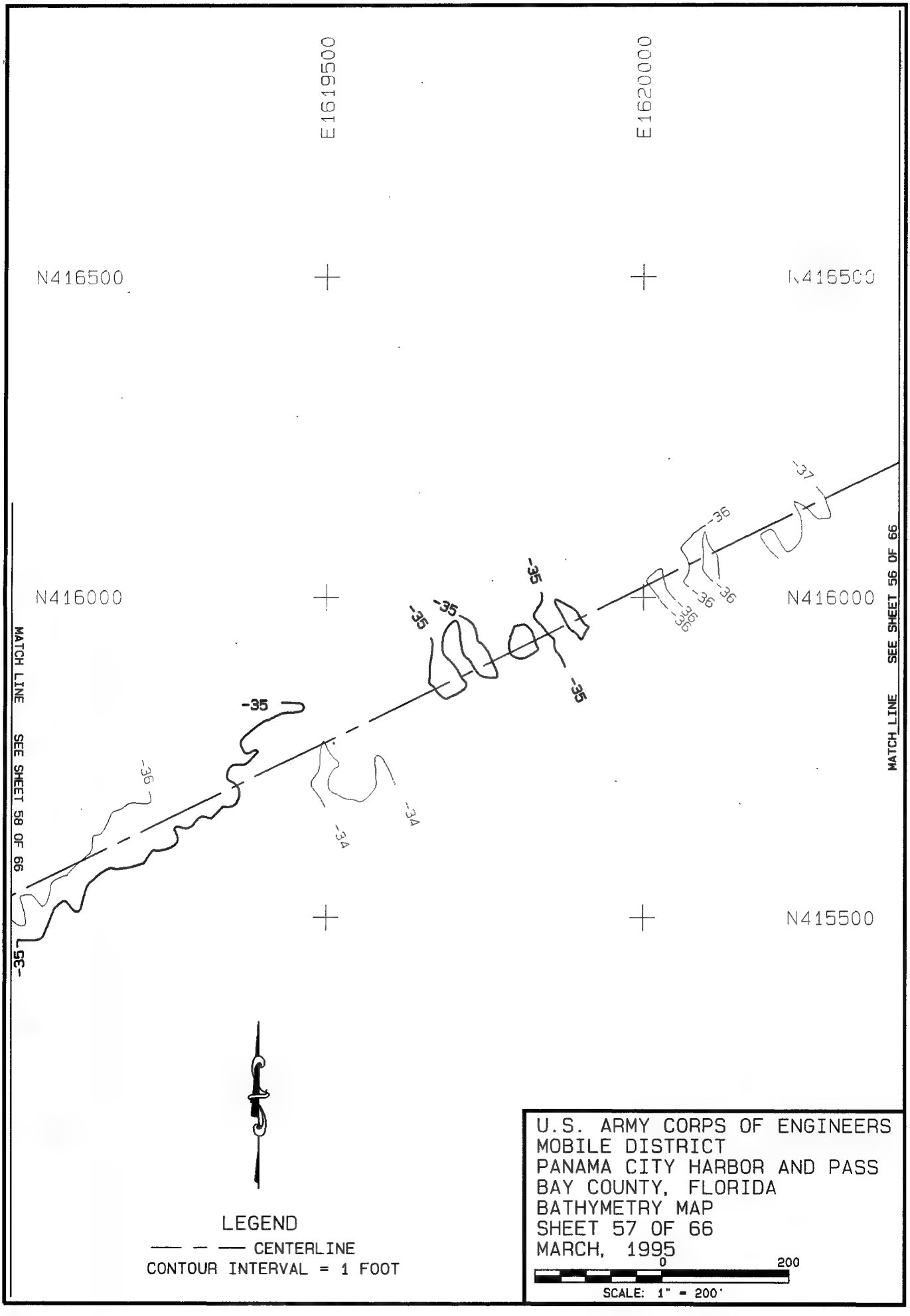
CONTOUR INTERVAL = 1 FOOT

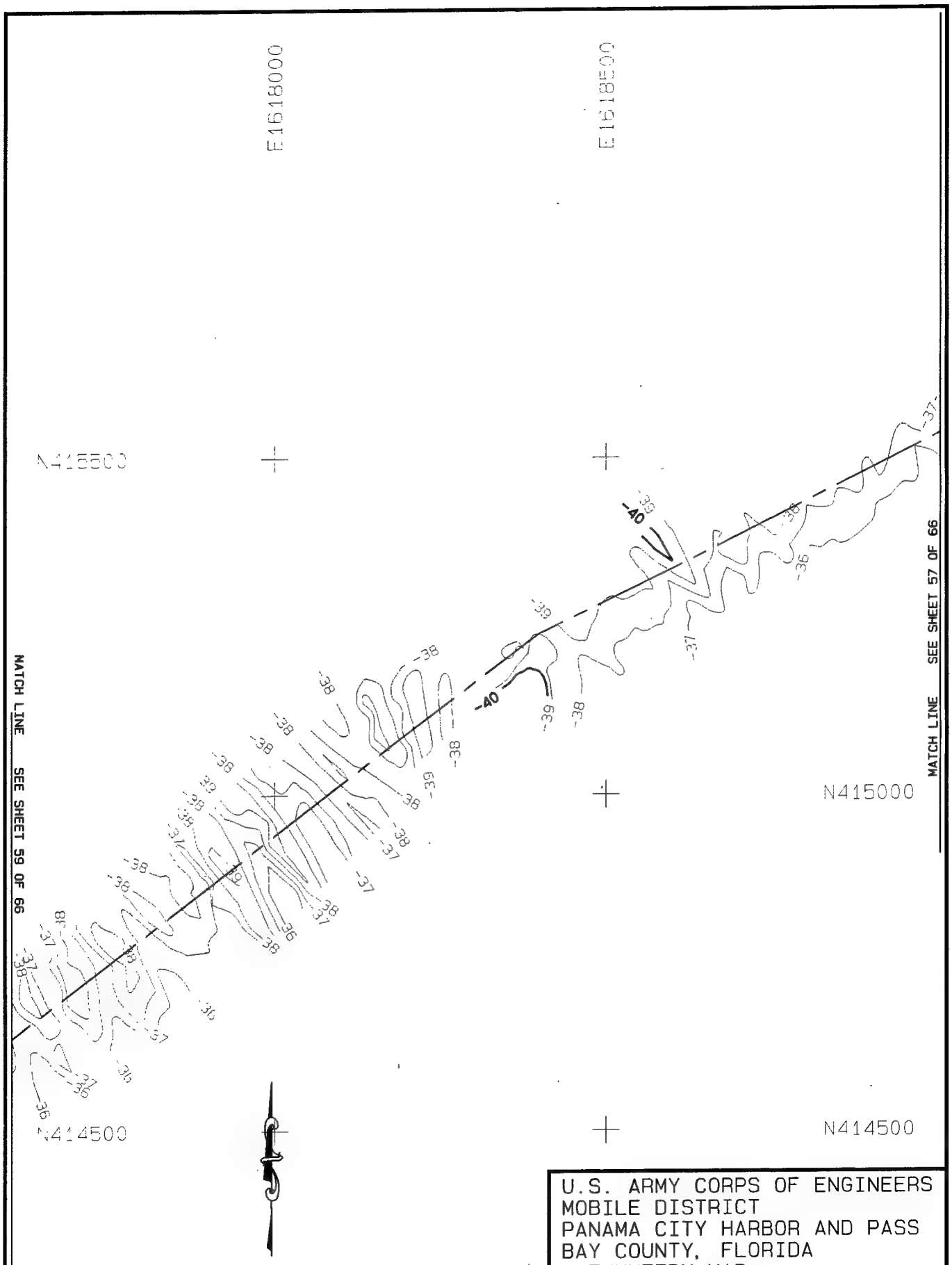
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 55 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'


E1621000
E1621500
N417500
N417500
N417000
N417000
N416500
N416500
MATCH LINE SEE SHEET 55 OF 65
MATCH LINE SEE SHEET 57 OF 66
-38
-39
-40
-41
-41
-40
-39
-38
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 56 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1619500
E1620000
N416500
N416500
N416000
N416000
N415500
-35
-35
-35
-35
-36
-36
-36
-36
-36
-37
-36
-34
-34
MATCH LINE SEE SHEET 58 OF 66
MATCH LINE SEE SHEET 56 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 57 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

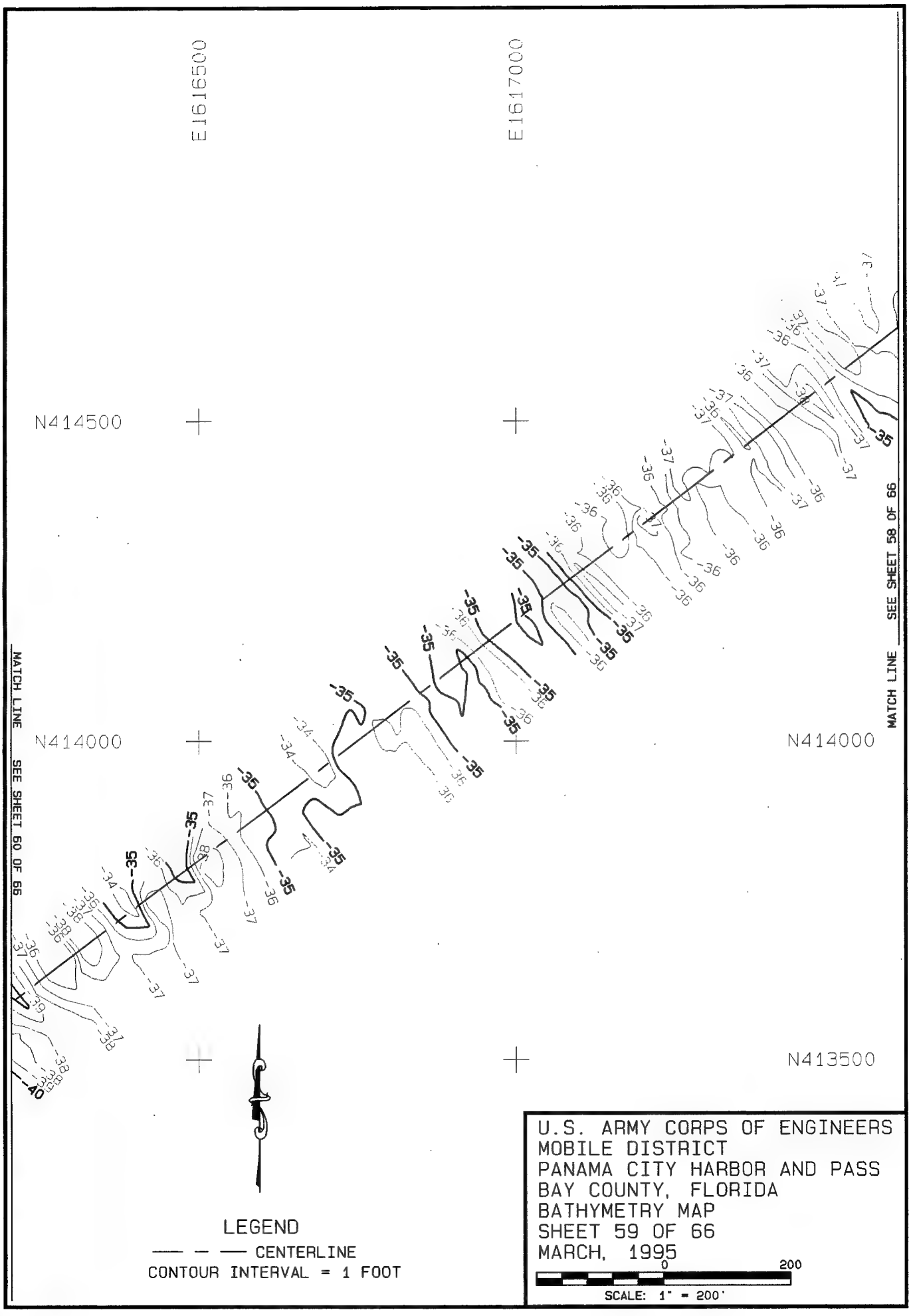
— — — CENTERLINE

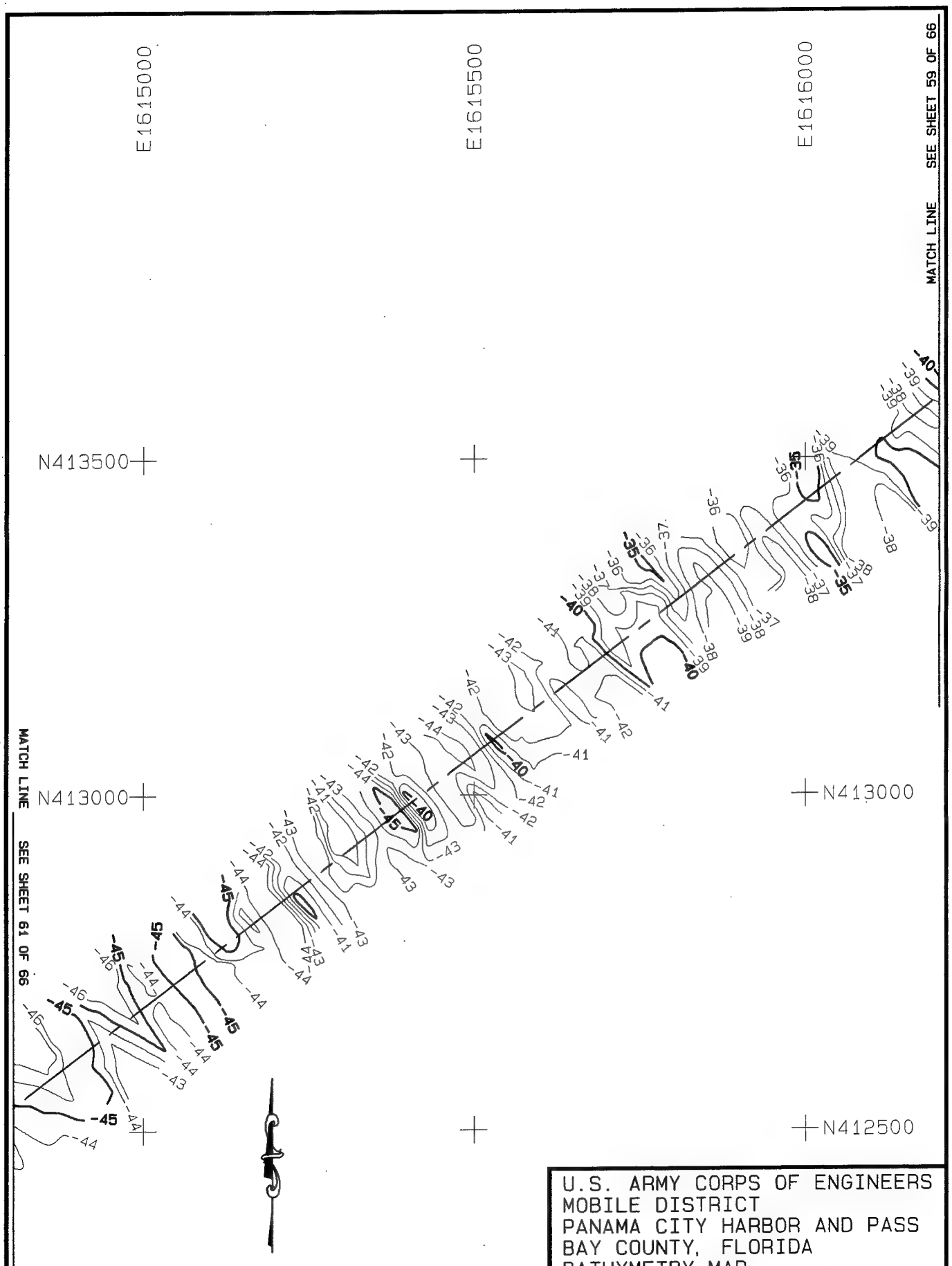
CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 58 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'


E1616500
E1617000
N414500
N414000
N413500
MATCH LINE SEE SHEET 60 OF 66
MATCH LINE SEE SHEET 58 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 59 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

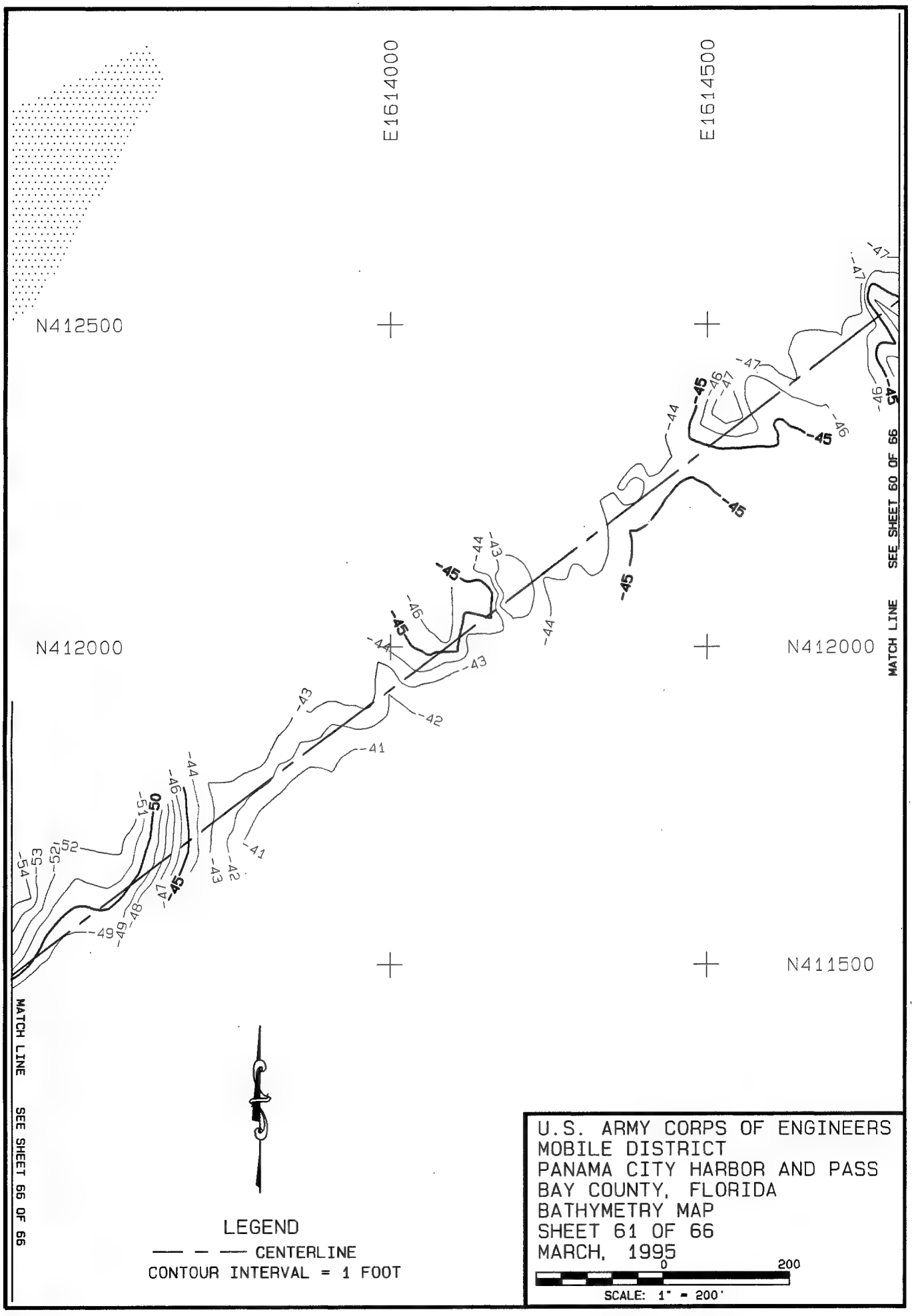
— — — CENTERLINE

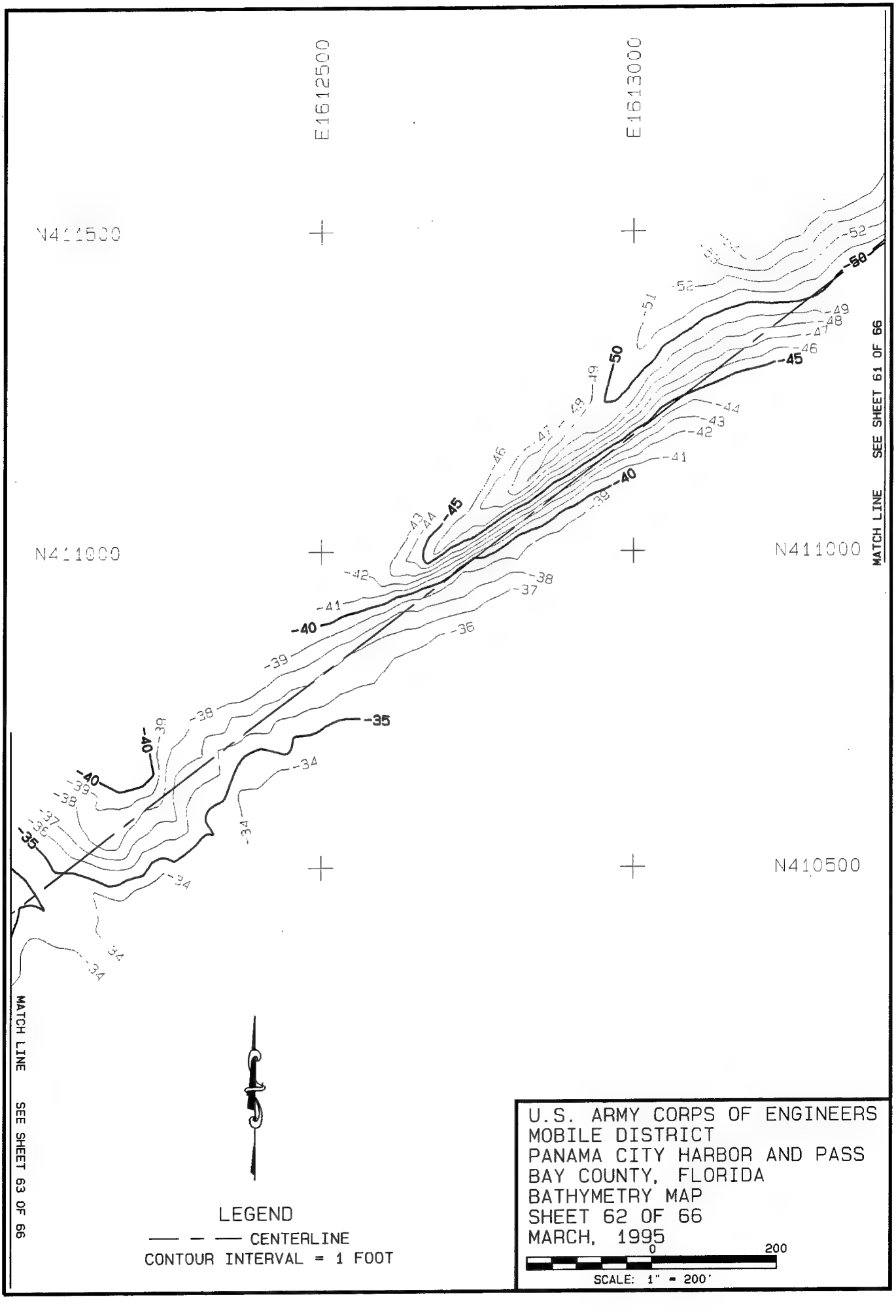
CONTOUR INTERVAL = 1 FOOT

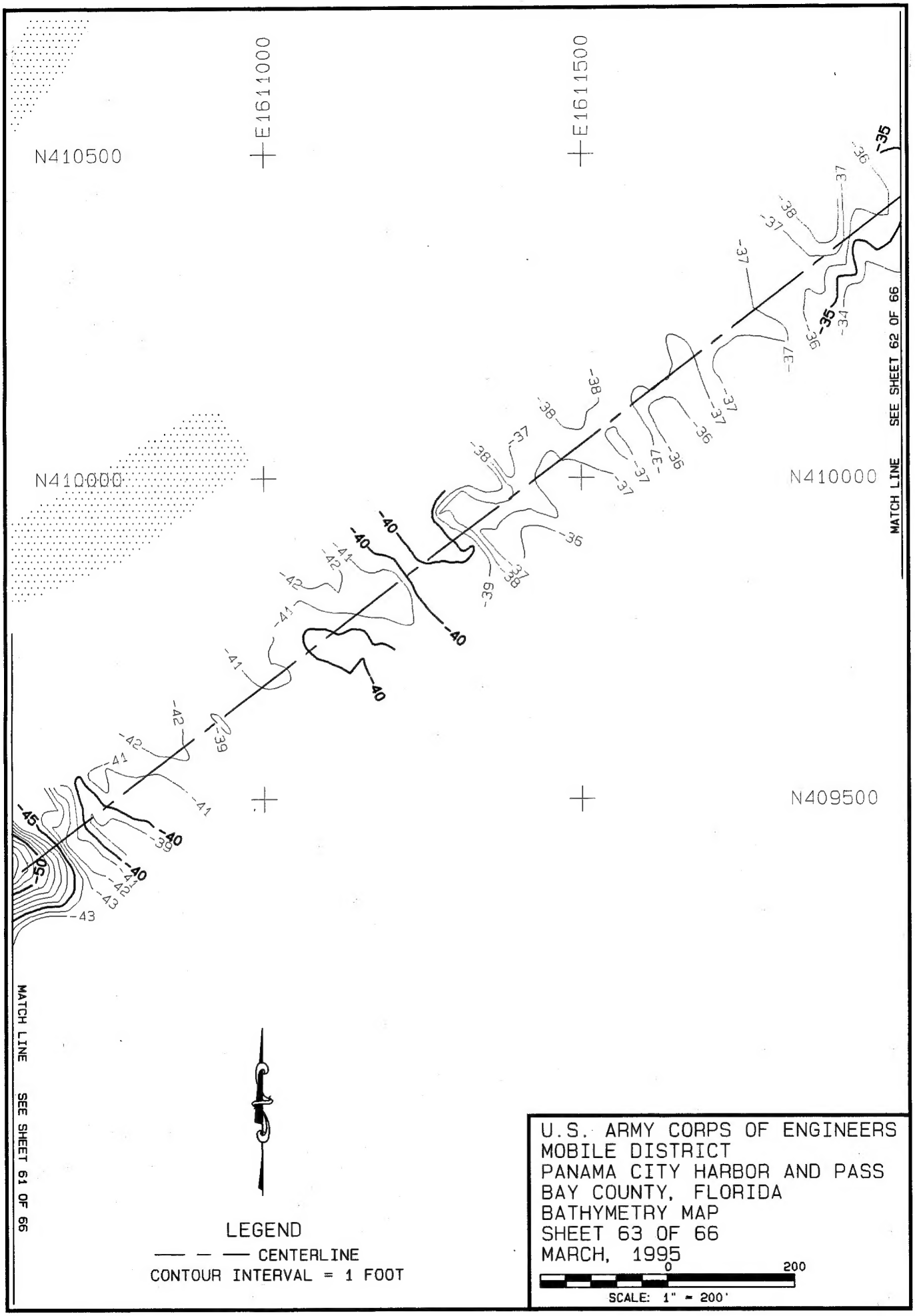
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 60 OF 66
MARCH, 1995

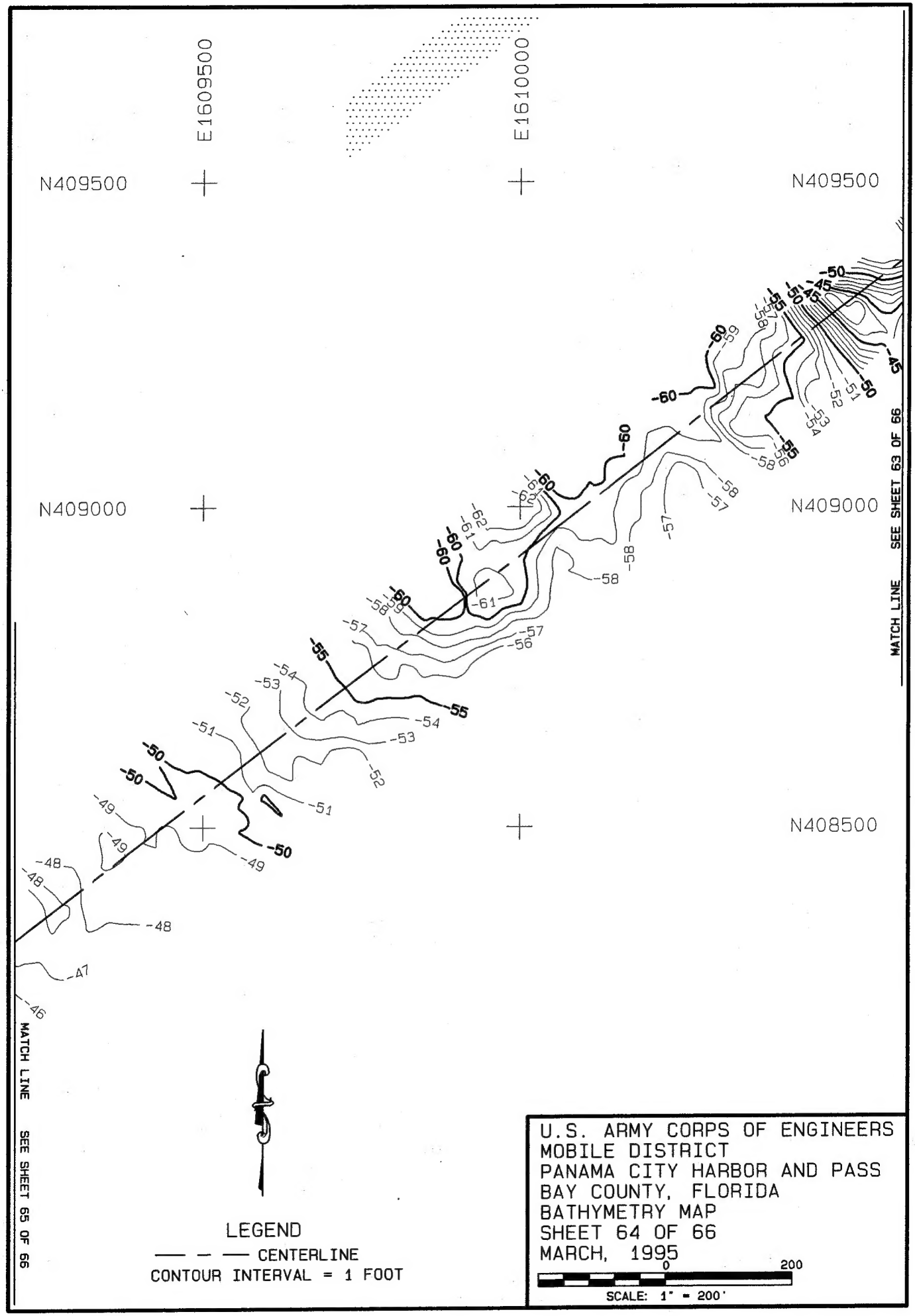
0 200

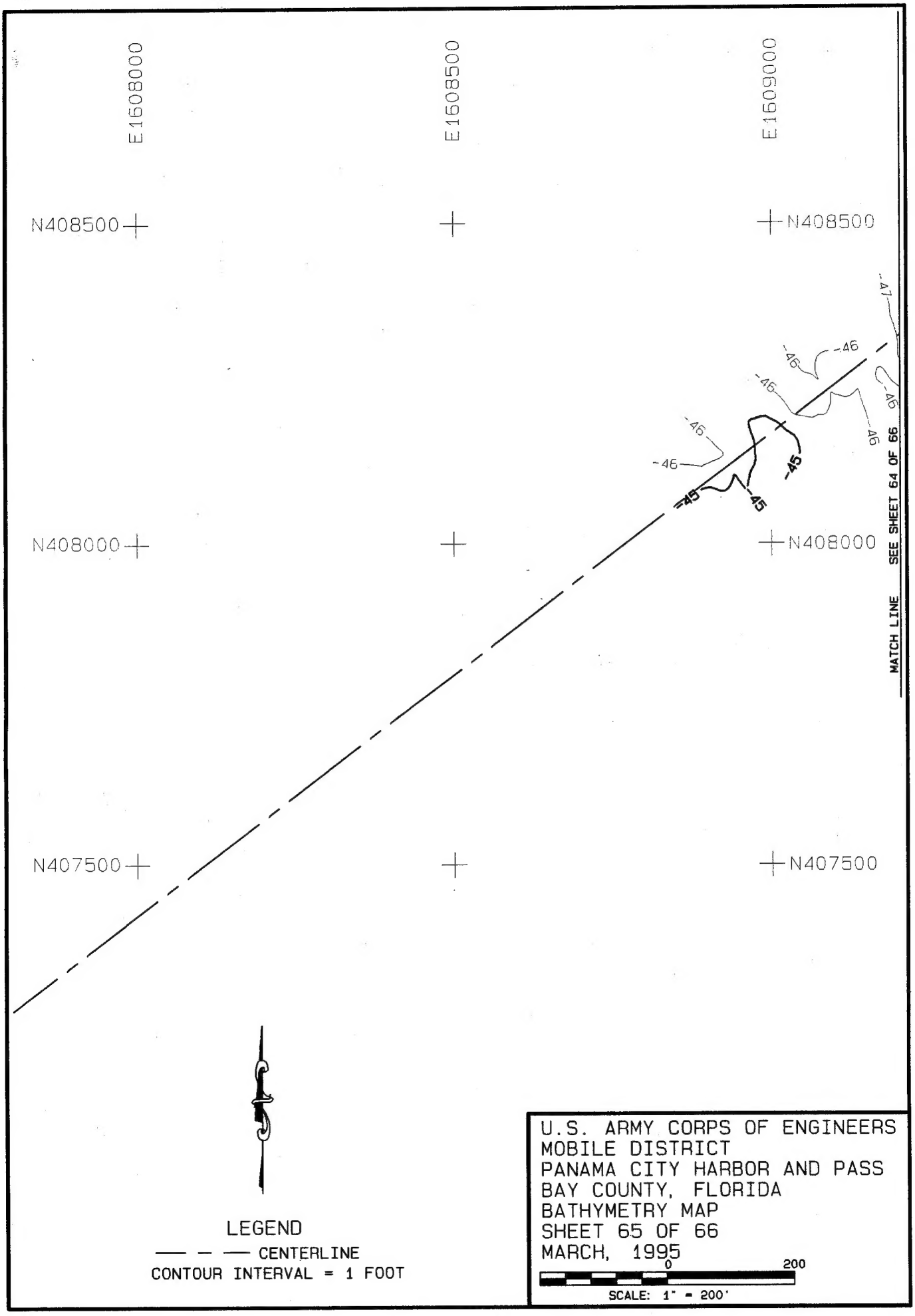
SCALE: 1" = 200'


E1614000
E1614500
N412500
N412000
N411500
MATCH LINE SEE SHEET 60 OF 66
MATCH LINE SEE SHEET 66 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 61 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1612500
E1613000
N411500
N411000
N410500
MATCH LINE SEE SHEET 61 OF 66
MATCH LINE SEE SHEET 63 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 62 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1611000
E1611500
N410500
N410000
N409500
MATCH LINE SEE SHEET 62 OF 66
MATCH LINE SEE SHEET 61 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 63 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'


E1609500
E1610000
N409500
N409500
N409000
N409000
N408500
MATCH LINE SEE SHEET 63 OF 66
MATCH LINE SEE SHEET 65 OF 66
LEGEND
CENTERLINE
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 64 OF 66
MARCH, 1995
0
200
SCALE: 1" = 200'



LEGEND

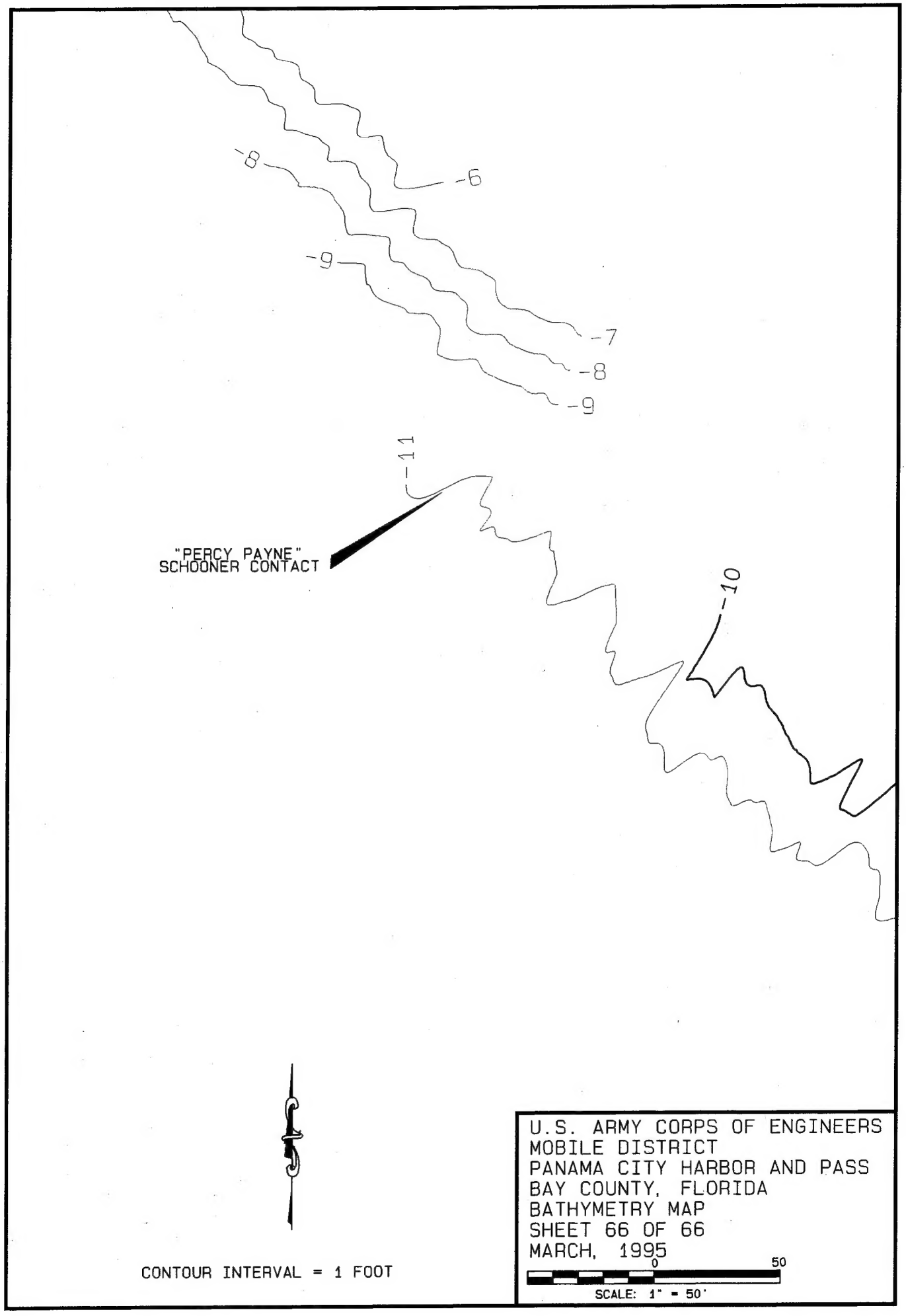
— – — CENTERLINE

CONTOUR INTERVAL = 1 FOOT

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 65 OF 66
MARCH, 1995

0 200

SCALE: 1" = 200'


-6
-8
-9
-7
-8
-9
-11
-10
"PERCY PAYNE"
SCHOONER CONTACT
CONTOUR INTERVAL = 1 FOOT
U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
PANAMA CITY HARBOR AND PASS
BAY COUNTY, FLORIDA
BATHYMETRY MAP
SHEET 66 OF 66
MARCH, 1995
0
50
SCALE: 1" = 50'